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ABSTRACT

A stratified two-stage cluster sample design was chosen for the Texas Assessment Project and is described in this document. The sample was designed so as to achieve a chosen level of precision in item analysis data within each of the 20 geographic regions chosen for analysis. Four sampling frames were developed: 9-year-olds; sixth graders; 13-year-olds; and 17-year-olds; or eleventh graders. Within each of the four sampling frames, stratification of schools was carried out on the basis of region, district type, district annual per-pupil expenditure, and expected number of students. Within each sampling frame, the schools in each of the 20 regions were cross-classified into 30 cells by five levels of district type and six levels of district annual per-pupil expenditure. It was also considered important to have both blacks and Mexican-Americans represented approximately in proportion to their proportions in the Texas student population. Large and small schools were sampled separately. In regions with a high proportion of black students, a larger number of schools were selected. The sampling method divides the frame in such a way that a near proportional number of students is selected from each final stratum. Finally, within these constraints, schools were selected random by computer. within schools, students were selected randomly. Characteristics of the resulting samples are presented. (Author/CTM)

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TEXAS ASSESSMENT PROJECT

SAMPLE DESIGN FOR THE TEXAS ASSESSMENT PROJECT

FINAL TECHNICAL REPORT

SUBMITTED BY

RESEARCH TRIANGLE INSTITUTE
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Final Technical Report
RTI Project Number 1558

SAMPLE DESIGN FOR THE 1978 TEXAS ASSESSMENT PROJECT (TAP)

By

David L. Bayless
Charles H. Benrud

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TAP REPORT DRAFT

I. Introduction

The purpose of this report is to document the sample design developed for the Texas Assessment Project (TAP). The major objectives of TAP are to assess the educational performance of selected groups of 9-, 13-, and 17-year-olds in citizenship and writing, and sixth and eleventh graders in reading and mathematics, using both criterion- and norm-referenced testing instruments. Thus, a total of five populations will be assessed. The assessment was initiated by the Texas State Senate, with the House of Representatives concurring, under concurrent Senate resolutions 29 and 30. The assessment is designed to provide performance results for students in the 20 Educational Service Center (ESC) regions in Texas and in the State as a whole. This requires that 20 independent samples be drawn, one for each ESC region. Statewide results will be aggregated from the regional samples. Performance by region and for the whole State will be reported in the following categories:

1. District type
    a. Major urban
    b. Other central cities
    c. Suburban
    d. Nonmetropolitan
    e. Rural
2. Average Daily Attendance of District
    a. 50,000 or more students
    b. 10,000 to 49,999 students

c. 3,000 to 9,999 students

d. 500 to 2,999 students

e. Under 500 students

3. Per Student Expenditure of District

a. Under $700

b. $700 to $799

c. $800 to $899

d. $900 to $999

e. $1,000 or more

4. Sex of Student

a. Male

b. Female

5. Ethnicity of Student

a. Black

b. Mexican-American

c. Other

Other reporting variables that will be considered for analysis are: educational emphasis in the home, amount of television watched nightly, time spent on homework, languages other than English spoken in the home, highest educational level attained by parents, educational aspirations after leaving school, eligibility for free lunch, and participation in the following State and Federal educational programs:

1. Education for the Gifted and Talented

2. Special Education

3. Title I (Regular)

4. Title I (Migrant)

5. State Compensatory Education

The sample was deliberately designed so that results of sufficient statistical precision at the school district, campus (school)*, teacher, and student levels cannot be reported. Nor will results for any reporting variable be given by ESC region. For example, results for ethnicity groups within ESC regions will not be given.

For the 9-, 13-, and 17-year-olds, performance in citizenship and writing will be obtained from the National Assessment of Educational Progress (NAEP). Using these data, the following types of results will be compared:

1. Comparisons of State and ESC region performance levels in citizenship and writing with those of the Southeast and Western regions in the United States and the nation as a whole.
2. Comparisons of the performance levels on the NAEP citizenship and writing items of groups of Texas students with State performance levels, e.g., performance within each of the 20 ESC regions versus that in the whole State.
3. Comparisons of the performance levels of Texas 9-, 13-, and 17-year-olds on items administered at more than one age level ("overlap" items).

Norm-referenced measurements in the subject areas of reading and mathematics will be collected from a sample of students at the sixth

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*The terms "campus" and "school" are used interchangeably throughout this report.

grade level. For these data, weighted results for Texas students and for subpopulations of Texas students defined by the above-mentioned reporting variables will be reported. Weighted normative distributions of the test scores will also be reported for comparison with the normative distributions provided by the publishers of the tests.

In addition, criterion-referenced measurements, developed by the Urban School Districts of Texas and the Educational Testing Service (ETS) in reading and mathematics, will be collected from samples of sixth and eleventh grade students. Results will be reported on the performance of Texas students in terms of the above-mentioned reporting variables and the objective of the criterion-referenced test.

The sections that follow describe the sample design for selecting the random sample of schools and students to provide the data to meet the objectives of TAP.

II. Determination of Sample Sizes and Precision

The testing of samples of students has advantages over the testing of all students in terms of cost and effectiveness. It reduces the total time and effort required on the part of both students and school personnel. It will yield results that meet the objectives of TAP. As mentioned earlier, those objectives do not include the reporting of results for any individual student, teacher, school, or school district in Texas.

The results of sampling are not expected to be exactly the same as those of a census (i.e., the testing of all students in the population). However, when sampling is carried out in a scientific way

(each unit being selected in a random fashion with known probability), it is possible to make unbiased estimates of the population values of item and objective percent correct, the normative distribution of test scores, etc. It is also possible to make an objective estimate of the sampling error, which is the difference between the value estimated from the sample and that which a census would have yielded. This statement is based on the assumptions that the same assessment methods are used in the census as in the sampling and that there is no measurement error in the assessment instrument. The design of the TAP sample permits the calculation of unbiased estimates of the sampling error on the basis of the assessment data.

The size of the sampling error depends primarily on two factors which are controllable, viz., the design of the sample and the size of the sample. For example, if a simple random sample* of 10,000 students were selected, the standard error of a sample estimate of 50 percent would be 0.5 percent.** The sample estimate and its standard error permit the construction of an interval which has a known probability of including the true population value. In the example cited above, we are 95 percent confident that the interval

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*A simple random sample of 10,000 students is obtained by listing all students in the population, numbering the names serially, and generating 10,000 unique random numbers. The names corresponding to the random numbers identify the students in the sample. (The difficulty of doing this for, say, eleventh graders in Texas is illustrated by the fact that the list would contain over 199,000 names.)

**If a simple random sample of size n is drawn from a large population, and the percentage having a given attribute is found to be p, the standard error of the estimate p is given by $\sqrt{p(100-p)/n}$. (If n is larger than a small fraction of the population, a finite population correction factor should be inserted in the above formula.)

between 49 percent [50 - 2(.5)] and 51 percent [50 + 2(.5)] includes the true population percentage. That is, if the sampling estimation procedures were to be repeated over and over again, 95 percent of the estimated intervals of a half-width of two times the standard error would include the true population value. If a degree of confidence other than 95 percent is desired, the multiplier of two must be replaced by the value appropriate to the desired degree of confidence. Tabulations of such values are readily available.

Because of the difficulty and expense of listing the entire population, simple random samples are not suitable for statewide assessment projects. More complex sampling methods must be used which, in turn, require more complex methods of estimating the sampling errors.

The Texas Education Agency decided that the standard of sample precision for a statewide item percent correct should be about 1.25 percentage points for the half-width of a 90 percent confidence interval. They specified further that the sample precision for an item percent correct for each of the 20 ESC regions should be about 5 percentage points for the half-width of a 90 percent confidence interval. Given the requirements of TAP, RTI decided that a stratified two-stage cluster sample design was appropriate. (A similar sample design is used in NAEP.)

For the first stage, the school is the sampling unit; for the second stage, the student is the sampling unit. Within schools (clusters), a simple random sample of eligible students will be selected. The stratification or grouping of the schools is described in section IV

of this report. Statistical methods which take into account the specifications and implications of this sample design in analyzing the resultant data are described in appendix C.

One of the implications of the stratified two-stage cluster sample design is that the sampling error is greater than it would be for a simple random sample of the same size. The larger error is due to the correlation of responses of students within clusters (schools). Students within a given school tend to be more alike in their responses to given test items than students drawn from a statewide list of all eligible students would be. On the basis of educational assessments similar to TAP, it was decided to assume an intracluster correlation coefficient of 0.03 in designing the assessments for 13- and 17-year-olds and eleventh graders (the secondary school populations) and an intracluster correlation coefficient of 0.05 in designing the assessments for 9-year-olds and sixth graders (the elementary school populations). The major reasons for a different intracluster correlation coefficient between the elementary and secondary school populations are these: (1) school sizes differ in the two populations, and (2) attendance areas of the elementary school population tend to be more homogeneous than those of the secondary school population.

The design effect (DEFF), which is the ratio of the variance (square of the sampling error) of a sample estimate resulting from a complex sample design (stratified two-stage sampling) to the variance of an estimate based on a simple random sample of the same size, can be computed as $[1 + \delta(m-1)]$, where δ is the intracluster (within-school)

correlation coefficient and m is the average simple random sample size planned for each cluster (school). Based on an average simple random size of 21* students per cluster (school), DEFF = 1 + 0.03(20) = 1.60 for the secondary school population and DEFF = 1 + 0.05(20) = 2.00 for the elementary school population, and their square roots are 1.26 and 1.41, respectively, which are the multiplicative factors applied to the sampling error of a simple random sample to obtain an approximation to the sampling errors of a stratified two-stage sample.

The decision to use an average simple random sample size of 21 students per school was based on (1) the practical considerations of conducting the testing in the schools and (2) the nearly optimum statistical properties of this sample size found by RTI in other assessment projects. If the sampling error is 0.5 percent (as in the example mentioned earlier) for a simple random sample of 10,000 students, then a stratified two-stage sample of the same size would yield a sampling error of 0.5 x 1.26 or 0.63 percent. The use of 10,000 students in a stratified two-stage sample can therefore be expected to provide estimates that 90 percent of the time are within (0.63 x 1.65, or 1.04 percentage points of the actual percentage, since a half-width of a 90 percent confidence interval is of approximately 1.65 sampling errors. Figure 1 gives the sampling error model used to plan the TAP sample. Figure 2 gives the assumptions made in using the sampling error model to plan the TAP samples.

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*A simple random sample size of 25 students per school is planned, but a sample of 21 students per school is used here to adjust for nonresponse or attrition to the student sample due to students being absent on the day of the testing.

Figure 1

Sampling Error Model for Planning the Texas Assessment Project (TAP) Sample Design

$$\text{Sampling Error Model} = \sqrt{\underbrace{\left[\frac{p(100-p)}{n}\right] \times \left(1 - \frac{n}{N}\right)}_{\text{Simple Random Sampling Error}} \times \underbrace{\left[1 + \delta(m - 1)\right]}_{\text{Design Effect Factor (DEFF)}}}$$

Finite Population Correction

where

p is item percent correct

N is the size of the population being sampled

n is the size of the total sample to be randomly selected

δ is the intracluster (within-school) correlation coefficient

m is the average responding student sample size per cluster (school).

Figure 2

Assumptions of Sampling Error Model for Planning the Texas Assessment Project Sample Design

Assumptions	Comments
1. $\left(1 - \frac{n}{N}\right) \doteq 1$	This is a standard assumption in planning an assessment sample since the percent of the population in the sample is small ($n/N \doteq 0$). NOTE: The prime determinant of sample precision <u>is</u> <u>not</u> the percent of the population in the sample. This assumption does not hold true -- for example, for ESC region 9 ($n/N \doteq 15\%$) -- and the finite population correction is used in the model, it decreases the sampling error.
2. $p = 50\%$	This is the standard assumption in planning an assessment sample since $p = 50\%$ gives the maximum sampling error of a simple random sample.
3. $m = 25$ (Planned)	The planned number of students to be selected per assessment instrument is 25 students. This cluster sample size has been discovered to have nearly optimum statistical and cost properties and reduces the response burden of each sample school.
4. $m = 21$ (Estimated Actual)	Twenty-one responding sample students per school was used in determining the sampling error as a means of adjusting for sample attrition or non-response in the planned student sample.
5. $\delta = .03$ or $.05$	Based on the analysis of other State assessment projects, an intracluster correlation coefficient of $\delta = .03$ was assumed for secondary school populations and $\delta = .05$ for elementary school populations since the average size of school differs for these two school populations and the attendance area of an elementary school tends to be more homogeneous than that of a secondary school. It is further assumed that intracluster correlation coefficients are the same for each ESC region.

Using the sampling error model developed above, Table 1 provides, for alternative student and school samples sizes, the predicted sampling errors and predicted half-widths of 90 percent confidence intervals for a percentage whose true or population value is 50 percent for the elementary and secondary school populations. Given the sample precision requirement for each of the 20 ESC regions that the results be within 5 percentage points at the 90 percent level of confidence, planned school and student sample sizes of 25 schools and 625 students and 20 schools and 500 students are needed, respectively, for the elementary and secondary school populations in each ESC region. Consequently, a planned total of 12,500 students and 500 schools is needed for each assessment instrument of the elementary school populations (9-year-olds and sixth graders) and a planned total of 10,000 students and 400 schools for each assessment instrument of the secondary school populations (13- and 17-year-olds and eleventh graders) since the sampling of students and schools will be conducted independently in each of the 20 ESC regions. Table 1 provides the half-widths of 90 percent confidence intervals of 1.14 and 5.09 percentage points for a population percentage of 50 percent under the sample design condition described above. These sample precision levels are within the sample precision standards set by the Texas Education Agency for TAP and are building blocks for determining the sample sizes and precision of TAP.

Table 2 summarizes the planned school and student sample sizes by each of the populations to be assessed. Thus, the planned total student sample size for TAP is 115,000 students. It is predicted that about 2,300 separate schools will be in the final sample since some

Table 1

Predicted Sample Precision for Alternative Planned Student and School Sample Sizes

Planned Student Sample Size (n)	Planned School Sample Size[1]	Predicted Sampling Error of Percentage of 50%		Predicted Half-Width of 90% Confidence Interval of Percentage of 50%	
		For Elementary School Populations[2]	For Secondary School Populations[3]	For Elementary School Populations[4]	For Secondary School Populations[5]
300	12	4.08	3.65	7.35	6.57
500	20	3.16	2.82	5.69	5.09
625	25	2.82	2.24	5.09	4.02
1000	40	2.24	2.00	4.03	3.60
2000	80	1.58	1.41	2.85	2.55
3000	120	1.29	1.15	2.32	2.08
4000	160	1.12	1.00	2.01	1.80
5000	200	1.00	.89	1.80	1.61
6000	240	.91	.82	1.64	1.47
7000	280	.85	.76	1.52	1.36
8000	320	.79	.71	1.42	1.27
9000	360	.75	.67	1.34	1.20
10,000	400	.71	.63	1.27	1.14
12,500	500	.63	.56	1.14	1.03

[1] Planned school sample size equals planned student sample size divided by 25.

[2] Sampling error for elementary school population equals $\sqrt{\frac{50 \times 50}{n}\ [1 + (.05)(20)]} = \sqrt{\frac{5000}{n}}$.

[3] Sampling error for secondary school population equals $\sqrt{\frac{50 \times 50}{n}\ [1 + (.03)(20)]} = \sqrt{\frac{4000}{n}}$.

[4] Half-width of 90 percent confidence interval equals 1.8 times the predicted sampling error of elementary school populations.

[5] Half-width of 90 percent confidence interval equals 1.8 times the predicted sampling error of secondary school populations.

Table 2

Planned Student Sample Sizes by Populations To Be Assessed for the Texas Assessment Project

Populations To Be Assessed	Subjects Assessed	No. of Assessment Instruments per Population	Planned No. of Schools in the Sample	Planned No. of Students in the Sample
9-year-olds	Citizenship and writing	2[1/]	500	25,000
Sixth graders	Reading and math	4[2/]	1,000[3/]	50,000
13-year-olds	Citizenship and writing	1[1/]	400	10,000
17-year-olds	Citizenship and writing	1[1/]	400	10,000
Eleventh graders	Reading and math	2	400	20,000
Total		10	2,300	115,000

[1/] A subsample of 40 schools for 9-, 13-, and 17-year-olds was selected using systematic sampling with a random start to administer the writing mechanics essay. The schools of these subsamples were identified in a random fashion from the complete sample for each age group and the data from the writing mechanics essay will be analyzed in accordance with the sample design as described in this report. Table A-14 on page A-14 of appendix A contains the sample design parameters to select the subsample.

[2/] Two of the instruments will be used for the norm-reference assessment and two for the criterion-reference assessment in reading and mathematics.

[3/] Two school samples were planned for the grade six assessment, one for the norm-reference assessment and one for the criterion-reference assessments. However, certain schools will be selected for both assessments.

[4/] The actual number of schools in the sample will be about 2,300 since some of the schools will be selected for more than one assessment, e.g., a high school selected for both eleventh grade and 17-year-old assessments.

schools will participate in more than one assessment. Note in Table 2 that the number of sample schools per assessment instrument for each population changes from 500 schools for populations of 9-year-olds and sixth graders to 400 schools for populations of 13- and 17-year-olds and eleventh graders due primarily to the assumptions of the intra-cluster correlation coefficients of 0.05 and 0.03 for the elementary and secondary school populations, respectively.

The number of assessment instruments for each population varies with the populations to be assessed. This variation is due primarily to the amount of testing time per student for each instrument and content to be covered in each assessment instrument in terms of the number of test items. For the citizenship and writing assessment of 9-year-olds, it was decided that each student should not be tested for over 45 minutes. This restriction resulted in two test packages of items for the assessment of the 9-year-olds. Each student in the assessment sample will be administered one test instrument. With this restriction, two separate (nonoverlapping) samples of 12,500 students are needed for the assessment of 9-year-olds. For the assessment of sixth graders, four separate samples of 12,500 students are needed. Two of the samples will be used for the two norm-referenced instruments in reading and mathematics, and two of the samples will be used for the criterion-referenced instruments in reading and mathematics. Similarly, two samples of 10,000 students each are needed for the writing and citizenship instruments for the populations of 13-year-olds and 17-year-olds, respectively. The final two samples of 10,000 students each will be used for the two

criterion-referenced instruments of reading and mathematics for the eleventh graders.

III. The Sampling Frames

Four sampling frames were developed for use in selecting samples of schools for the five populations of the 1978 Texas assessment:

9-year-olds	(2,992 schools)
Sixth graders	(2,250 schools)
13-year-olds	(1,582 schools)
17-year-olds (and eleventh graders)	(1,227 schools)

Each of these sampling frames included all of the schools that were expected to have eligible students, on the basis of grade range and total enrollment information which was provided to RTI by the Texas Education Agency on a computer tape. The data designated campuses by numbers only, assuring that the selection of all sample schools by RTI be done without the names of the campuses. The schools of the 17-year-olds and eleventh graders were listed on the same sampling frame. (Only six schools in the State of Texas were found to have a grade twelve and not a grade eleven.) Depending on its grade range, a school could be included in one, two, three, or all of the sampling frames, or none at all (e.g., schools whose grade range is K-2). For each school, the total enrollment was divided by the number of grades to obtain the estimated enrollment for each grade. Numbers of 9-, 13-, and 17-year-olds were estimated by applying 1970 U.S. Census Texas age/grade percentages to the estimated grade enrollment. The four

sampling frames were then used to select the TAP sample. The sections that follow describe the sample design and procedure used to select the samples.

IV. Stratification and Sample Allocation

Before selecting the samples, the schools in each of the four sampling frames were grouped or stratified into a number of strata. Stratification is the grouping together of eligible schools to improve the precision of population estimates (make the sampling error smaller) and to insure a representative spread of the sample across the range of values for the stratification variables. For the TAP sample, the ESC regions are an illustration of a stratification variable. Ideally, from a statistical viewpoint, schools whose pupil's educational performances on any assessment item is nearly identical should be included in the same stratum; however, this is impractical to achieve in the actual design of the sample. Consequently, stratification variables are selected that are thought to produce relatively homogeneous strata of educational performance. Another consideration is that, for each stratification variable, data are needed that are complete and accurate for each school of the sampling frame. In addition to reducing the magnitude of sampling errors, stratification can be used to allow for the attrition or uneven distribution of certain groups so that estimates with acceptable and/or the same sampling error can be made for those groups, e.g., ESC regions. When this allowance is made, the sampling errors of estimates for the

entire population are slightly increased. Whatever the effect on sampling errors, stratification does not bias the sample estimates as long as the assessment data are analyzed using the appropriate weighting methodology.

Within each of the four sampling frames, stratification of schools was carried out on the basis of region, district type, district annual per-pupil expenditure, and expected number of students. In addition, school percent black enrollment was used in six regions to define special strata as a means to allow for uneven distribution of the statewide black population so as to fairly represent the black population in the total statewide sample.

A. Primary Strata

In the populations of 9-year-olds, 13-year-olds, sixth graders, 17-year-olds, and eleventh graders, the schools of each region were first cross-classified into 30 groups or cells by five levels of the district type variable and six levels of a district annual per-pupil expenditure variable. For each ESC region, some of these cells were empty since no schools were in the cross-classification of the specified population. The levels of each of these variables are defined by the rows and columns of table 3. The cells of table 3 are coded by their respective row and column numbers. These codes were used to define the primary strata within each ESC region.

To construct the primary strata of each ESC region, the number of eligible schools and students in each cell of each of the sampling frames (table 3) were analyzed and compared. The primary strata

Table 3

Cells of District Types and District Annual Per-Pupil Expenditures
Cross-Classification Used To Form Primary Strata for Each ESC Region of TAP Sample Design

		District Annual Per Pupil Expenditure					
District Type	(Code)	Not Known (0)	Under $700 (1)	$700 to $799 (2)	$800 to $899 (3)	$900 to $999 (4)	$1000 and Over (5)
Major Urban	(1)	(1,0)	(1,1)	(1,2)	(1,3)	(1,4)	(1,5)
Other Central Cities	(2)	(2,0)	(2,1)	(2,2)	(2,3)	(2,4)	(2,5)
Suburban	(3)	(3,0)	(3,1)	(3,2)	(3,3)	(3,4)	(3,5)
Nonmetropolitan	(4)	(4,0)	(4,1)	(4,2)	(4,3)	(4,4)	(4,5)
Rural	(5)	(5,0)	(5,1)	(5,2)	(5,3)	(5,4)	(5,5)

were formed by combining adjacent cells of table 3 using the following criteria:

1. The primary strata would be the same for each of the sampling frames; that is, the same grouping of district type and per-pupil expenditure cells would be used for each of the four age/grade levels.
2. The number of schools and students across the primary strata of each region should be a reasonable allocation, in particular, no primary stratum should have a very small (less than 10 percent of total) number of students.
3. Assignment of the cells to the primary strata across ESC regions should be done in such a way so as to consider variation of the district type and per-pupil expenditure characteristics of each ESC region. For example, those ESC regions containing cells which contain major urban schools should be assigned to their own primary strata when feasible.
4. All schools (campuses) whose expected number of eligible students for the population being assessed was 19 or fewer students, should be labelled as "small" schools. These schools were then sampled in a separate stratum which is described in section IV.E of this report. The "small" schools were sampled in separate strata that control the variation of statistical weights of the students assessed in the "small" schools. This method has a positive effect

on sampling error since extreme variation in student weights has a tendency to increase the sampling error.

A total of two to five primary strata resulted for each of the 20 ESC regions. The cell codes of table 3 of each primary stratum for each of the ESC regions are provided in table 4.

B. Allowance for Sampling of Ethnic Populations

In planning the assessment, it was considered important to have both blacks and Mexican-Americans represented in the samples approximately in proportion to their proportions in the State student populations. It is important to mention that these variables were given priority over other unevenly distributed variables, e.g., schools in major urban districts of the State. This was done primarily to assure adequate sample sizes for black and Mexican-American populations so that sample estimates of appropriate precision would result. To determine the number of blacks and Mexican-Americans in the samples that could be expected to result with no allowance for distribution, the population percentages of blacks and Mexican-Americans for each region were applied to the numbers expected to be in the age/grade samples of each ESC region. When these regional minority sample sizes were totaled, it was found that there would be sufficient Mexican-Americans in the statewide sample due to the spread of this population across the ESC regions but the number of blacks in the sample was below the number needed to produce a proportional statewide representation. This condition was due primarily to the fact that the black population is concentrated in ESC regions 4, 5, 6, 7, 8, and 10.

Table 4

Primary Strata for All Sampling Frames Within ESC Regions Defined by District Type and District Per-Pupil Expenditure Codes of Table 3

Region Code	Primary Stratum Code 1	2	3	4	5
1	2,1	2,2 2,3 2,5	4,1 4,2 5,1	4,3 4,4 4,5 5,5	
2	1,3 3,3	4,0 4,1 4,2 4,3 5,3	4,4 4,5 5,4 5,5		
3	4,2 4,3 5,0 5,3	4,4 5,4	4,5 5,5		
4	1,3 2,5	3,4 3,5 3,1 32,33	4,2 4,3 4,4 4,5 5,4 5,5		
5	2,5	3,2 3,4 3,5	4,1 4,2 4,3 4,5 5,4 5,5		
6	2,3 3,4	4,1 4,2 4,3 4,4 4,5	5,0 5,2 5,3 5,4 5,5		
7	2,3 2,4	4,1 4,2 4,3 4,4 4,5	5,1 5,2 5,3 5,4 5,5		
8	2,4 3,2	4,1 4,2 4,3 4,4	5,1 5,2 5,3 5,4 5,5		
9	2,3	4,2 4,3 4,4 4,5 5,1 5,2 5,3 5,5			
10	1,5 2,3	3,2 3,3 3,4 3,5	4,1 4,2 4,3 4,4 4,5 5,1 5,2 5,3 5,4 5,5		
11	1,4	3,0 3,1 3,2 3,3 3,4 3,5	4,1 4,2 4,3 4,4 4,5 5,1 5,2 5,3 5,4 5,5		
12	2,1 2,3 2,5 3,1 3,2	4,1 4,2 5,1 5,2	4,3 4,4 4,5 5,3 5,4 5,5		
13	1,5	3,1 3,2 3,3 3,4 3,5	4,1 4,2 5,0 5,1 5,2	4,3 5,3	4,4 4,5 5,4 5,5
14	2,4	4,1 4,2 4,3 5,1 5,2 5,3	4,4 4,5 5,4 5,5		
15	2,3	4,0 4,1 4,2 4,3 5,0 5,1 5,2 5,3	4,5 5,4 5,5		
16	2,4 3,4	4,2 4,3 4,4 5,0 5,3 5,4	4,5 5,5		
17	2,3	4,1 4,2 4,3 4,4 5,3 5,4	4,5 5,5		
18	2,4	4,3 4,4 5,0 5,1 5,2	4,5 5,5		
19	1,3	3,1 3,5	4,1 4,2 5,3 5,4 5,5	4,1 4,2 4,3 4,4 4,5 5,1 5,3 5,4 5,5	
20	1,3	3,0 3,1 3,2	3,3 3,5		

It was therefore decided to include a greater number of schools in those ESC regions having relatively high numbers of black students, to the extent that the expected proportions in the statewide sample(s) would be approximately the same as the proportion in the statewide population(s). Since the highest percentages of blacks are in regions 4, 5, 6, 7, 8, and 10, the allowance was made in these ESC regions. Section IV.D describes the methodology of this allowance.

C. Final Strata -- ESC Regions Not Oversampled

In each of the four sampling frames, the primary strata of regions 1, 2, 3, 9, and 11 through 20 were divided into final strata on the basis of expected numbers of students. The schools were ordered by ESC region, primary stratum, and expected number of students per school (downwards). For each primary stratum, the numbers of students were accumulated and the cumulative totals were printed on a computer printout.

In each primary stratum, the schools with 19 or fewer expected students were set aside as "small" schools, to be sampled separately. The cumulative total for schools with 20 or more expected students was divided by the primary stratum's number of sample schools, to obtain the average number of students to be represented by each sample school. This quantity will be denoted by ANSRSS. Table 5 gives the number of sample schools initially allocated to each primary stratum for each ESC region and sampling frame. These sample school sizes are based upon a proportional allocation of the total number of schools to be selected in each ESC region (20 or 25 schools

Table 5

Initial Allocation of Sample Schools to Primary Strata
by ESC Region and Sampling Frame

ESC Region Code	Age 9 Primary Stratum					Grade 6 Primary Stratum					Age 13 Primary Stratum					Age 17/Grade 11 Primary Stratum				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
1	9	6	7	3	-	8	6	8	3	-	7	5	6	2	-	6	5	4	3	-
2	10	7	8	-	-	10	7	8	-	-	8	6	6	-	-	9	5	6	-	-
3	10	5	10	-	-	10	5	10	-	-	8	4	8	-	-	8	4	8	-	-
4	10	12	3	-	-	10	12	3	-	-	8	10	2	-	-	8	10	2	-	-
5	6	9	10	-	-	7	9	9	-	-	5	7	8	-	-	6	8	6	-	-
6	9	13	3	-	-	9	13	3	-	-	7	10	3	-	-	8	10	2	-	-
7	5	16	4	-	-	5	15	5	-	-	4	12	4	-	-	4	12	4	-	-
8	4	17	4	-	-	4	16	5	-	-	4	12	4	-	-	4	14	2	-	-
9	9	16	-	-	-	8	14	3	-	-	7	10	3	-	-	8	10	2	-	-
10	10	12	3	-	-	10	11	4	-	-	8	9	3	-	-	7	11	2	-	-
11	8	10	7	-	-	8	10	7	-	-	6	9	5	-	-	6	9	5	-	-
12	13	7	5	-	-	12	8	5	-	-	10	6	4	-	-	10	6	4	-	-
13	10	4	3	4	4	9	5	3	4	4	9	3	2	3	3	8	4	2	3	3
14	9	7	9	-	-	10	6	9	-	-	8	5	7	-	-	8	5	7	-	-
15	8	14	3	-	-	7	14	4	-	-	6	11	3	-	-	7	10	3	-	-
16	10	8	7	-	-	9	9	7	-	-	7	7	6	-	-	8	6	6	-	-
17	9	11	5	-	-	9	11	5	-	-	7	9	4	-	-	8	8	4	-	-
18	5	11	9	-	-	6	10	9	-	-	4	9	7	-	-	5	8	7	-	-
19	13	10	2	-	-	14	9	2	-	-	11	7	2	-	-	10	8	2	-	-
20	7	6	6	6	-	6	7	6	-	-	5	5	5	5	-	5	4	7	4	-

per assessment instrument) using the size of the primary stratum within each of the ESC regions. Each school having a number of students greater than ANSRSS was designated as "self-representing" and was allocated in a separate final stratum; if the number of eligible students in the school was twice that of ANSRSS, it was designated for second-stage sampling at twice the standard rate. These schools will have a sample of 50 (2x25) students for each assessment instrument selected for the school.

The method was employed primarily to give proper representation to students in schools whose total enrollment is large relative to other schools in the ESC regions. After the "self-representing" schools had been identified, the total expected student enrollment remaining was divided by the remaining number of "non-self-representing" schools, and the new ANSRSS factor was computed and used to determine additional "self-representers." This process was repeated until all "self-representing" schools were identified; the list of schools remaining, the "non-self-representers", was then divided into final strata on the basis of expected numbers of students, so that either two or three sample schools per stratum would be randomly selected.

In summary, the "deeply stratified" sampling method divides or stratifies the sampling frame of schools within each primary stratum in such a way that a near proportional or representative number of students is selected from each final stratum. It is important to point out that the sampling procedure allocates the student sample

to the final strata based on the expected number of students to be assessed, since the unit of analysis of TAP is the student. The number of schools of the final strata is not used to define the final strata. Use of the number of schools to define final strata is appropriate only when all of the students are tested in each sample school. Stated another way, to achieve a proportional or representative student sample, the sampling procedure defines each final stratum to contain approximately an equal number of students, since an equal number of schools and an equal number of students are to be randomly selected within each final stratum.

D. Final Strata -- Regions To Be Oversampled for Blacks

In each of the four sampling frames, the schools within each of regions 4, 5, 6, 7, 8, and 10 were ordered on the basis of the primary stratum and percent black of the school. Analyzing the results of these orderings, it was decided to oversample the black population in 11 primary strata for each sampling frame and assessment population. The schools with the highest percentage of blacks were oversampled in these primary strata for each age/grade population. In each primary stratum, a cutoff percentage of percent black was specified to divide the primary stratum into two intermediate strata of schools; the same cutoff percentage of black was used for all populations. Table 6 gives the primary stratum codes that were oversampled and the cutoff percentages. The schools with a percentage black above the cutoff percent were in the intermediate strata to be oversampled; the remaining schools were stratified into

Table 6

Primary Strata Code and "Cutoff" Percentage of Blacks Per School for Defining Intermediate Strata

Primary Strata Code	Percentage Black Per School Cutoff Percentage
4.1	85%
4.2	50%
5.1	60%
5.3	30%
6.2	40%
6.3	35%
7.1	40%
7.2	35%
7.3	30%
8.2	30%
10.1	90%

final strata as defined above. After analyzing the results of the oversampling procedure, it was decided to add further sample schools to ESC regions 4 and 10. The final allocation of sample schools to the intermediate oversampled strata resulted in the schools of these strata being oversampled at approximately twice the rate of the other schools in ESC regions 4, 5, 6, 7, 8, and 10.

The determination of the final strata of each intermediate stratum was done in the same way as each primary stratum in the other ESC regions (1, 2, 3, and 11 through 20). The final strata of all other primary strata of these ESC regions (4, 5, 6, 7, 8, and 10) were formed by the method described on the previous page.

E. "Small" Schools

Schools with 19 or fewer expected students in each of the four sampling frames were classified as "small" schools and put into a special sampling frame to be sampled separately. In the "small" school sampling frame, stratification was based only on "super" region and expected number of students. Table 7 gives the ESC regions that were allocated to five "super" regions that were used to sample the "small" schools. "Super" regions were used as strata to select the "small" schools because of disproportionate allocation of the total number of expected students in the "small" schools to the 20 ESC regions. Contrary to the age nine, grade six, and grade eleven sample schools, it was decided to administer one assessment instrument in each school, because of the small expected number of students available for testing in each selected "small" school. It was further decided that approximately 20 "small" schools would be sufficient for each assessment instrument to give these schools a fair representation in the assessment samples. Given this sample design decision, 40 sample schools were randomly selected for 9-year-olds and eleventh graders, 80 sample schools for sixth graders, and 20 sample schools for 13-year-olds and 17-year-olds. For each sampling frame, schools were ordered by

Table 7

Definition of "Super" Regions for Sampling "Small" Schools of TAP

"Super" Region Code	ESC Region Codes Contained in "Super" Region
1	7, 8, 10, 12, 13
2	3, 4, 5, 6
3	1, 2, 13, 20
4	9, 11, 14, 15
5	16, 17, 18, 19

"super" region and expected number of students, and final strata were established on the basis of the expected numbers of students. Table 8 gives the number of small schools and the expected number of students in the population. It is interesting that about 18 percent of the schools in all the populations being assessed by TAP are "small." The percentage of the total number of sample schools selected for a TAP assessment that are "small" is about 10 percent. As previously mentioned, the prime determinant of the sample precision from these schools is the absolute number of students from them that respond to an assessment instrument.

Table 8

Population and Sample Numbers of Schools and Expected Numbers of Students, "Small" Schools, by Super-Region and Age/Grade

Super-Region	9-Year-Olds				Grade 6			
	Schools		Students		Schools		Students	
	Population	Sample	Population	Sample	Population	Sample	Population	Sample
1	136	12	1506	112	83	24	890	307
2	61	8	605	85	48	12	496	114
3	69	8	638	81	49	12	490	129
4	115	8	1111	77	84	20	829	224
5	92	8	830	80	60	16	523	182
	473	44	4690	435	324	84	3228	956
	13-Year-Olds				Grade 11			
1	106	6	1063	78	80	12	1064	195
2	61	3	498	19	38	6	539	71
3	53	3	440	5	30	4	356	43
4	101	5	961	54	82	12	1001	182
5	72	4	689	51	45	6	558	66
	393	21	3651	207	275	40	3518	557
	17-Year-Olds							
1	81	6	888	72				
2	38	3	406	29				
3	31	2	301	7				
4	83	6	812	72				
5	48	3	482	27				
	281	20	2889	207				

V. Selection of Sample Schools

Within each "non-self-representing" final stratum, the number of schools selected with equal probability and without replacement (simple random sampling) from each final stratum was two or three from the populations of 9-, 13-, and 17-year-olds and eleventh graders and four to six from the sixth grade population. At least two schools were selected from each final stratum so that the sampling error can be estimated from the assessment data. Within each "self-representing" final stratum, each school was assigned the specified number of assessment instruments.

The sample selection process of the schools was done using an RTI-developed computer program that used as input the above stratification and sample size data. The computer program generates as output the random numbers for selecting the school in an unbiased fashion. In other words, all sample selections were done by the computer per the sample design, and no human judgment was used to select schools in a preferred or biased way.

VI. Selection of Sample Students

The selection of the sample students within each sample school for each assigned assessment instrument involves the implementation of the following procedure:

1. Each sample school developed a list of the eligible students for each population assessed in the school. The sample schools were provided instructions for developing

a student sampling frame, which was a list of all eligible students for each population assessed in the school. Students classified as non-English speaking, educable mentally retarded, or functionally disabled, were considered ineligible and not in the student population assessed. Students with birthdates falling between April 1, 1968, and March 31, 1969, and in grades three or four[1/] were in the 9-year-old population. Students with birthdates falling between June 1, 1964, and to May 31, 1965, and in grades 7 or 8 were in the 13-year-old population. Students with birthdates falling between October 1, 1960, and September 30, 1961, and in grades 11 or 12 were in the 17-year-old population. The age populations were defined in such a way that the students of TAP are the same average age at the time of testing (April 1978) as their national counterparts were when they were assessed in the NAEP samples.

2. The student sampling frames of each school are then sent to RTI, where RTI sampling statisticians randomly select

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[1/] The decision to use 9-, 13-, and 17-year-old students in grades three and four, grades seven and eight, and grades eleven and tewlve, respectively, instead of all grades as done by NAEP, was made by TAP staff for ease of collecting the assessment data. The condition will be accounted for in the analysis of the assessment data by comparing TAP results to NAEP results using data of the above-mentioned grades.

a simple random sample of the appropriate number of students for each assessment instrument assigned to the sample school. The sample size per assessment instrument in most cases will be 25 students, as previously described. Schools with a large enrollment in a "self-representing" final strata will have a sample size of 50 students per assessment instrument. These sample sizes are expected to produce an average of 21 or 42 completed assessment instruments.

An important feature of the school and student sampling procedures of TAP is that all sampling is done in a uniform and unbiased way by the same staff at a central location. The implementation of the student sampling procedure will require the collection and processing of a considerable number (2,234) of student sampling frames. The sampling of 17-year-old and grade eleven student populations in schools where both assessments have been selected will require the use of stratified simple random sampling to insure that students that are both age seventeen and in grade eleven are unbiasedly represented in the student sample.

VII. Characteristics of the Schools and Students Selected for the TAP Sample Design

The exact characteristics of the TAP school and student samples will not be known until the data collection, processing, and analysis are complete. However, it is possible to analyze the number of sample schools and expected counts of the students in

these schools for those reporting variables that were recorded in the school sampling frame. The student descriptive results were estimated by multiplying the sample size of each assessment instrument of each sample school by the percent of the school enrollment that has the attribute, e.g., percent black for the school times 25 students. For ease of a summary presentation, some of the results are provided for the aggregate of all TAP populations and samples assessed. The reporting variables analyzed are the 20 ESC regions, district type, district average daily attendance, district per-pupil expenditure, and ethnicity of student.

Table 9 summarizes the planned and selected number of schools and students for the five populations assessed. Note that a total of 113,307 students is expected for TAP. The primary reason that planned and expected school and student sample sizes do not match is due to the variation in the enrollment of the actual schools selected for the assessment; e.g., it is impossible to assess the planned number of sample students in every sample school and the complexities of the sample design. Due to the sampling of small schools, sampling of "self-representing" schools will lower the total planned sample size. A total of 2,234 different campuses or schools were selected for TAP. When the data collection phase of the assessment is implemented, this number will change due to the change of grade ranges in schools; e.g., a school had 9-year-olds (grades three and four) in the 1976-77 school year but it does not have grades three and/or four in April 1978. Procedures have been developed for these changes and will be implemented in the data collection and data analysis stages of the assessment.

Table 9

Planned School and Student Sample Sizes Versus Selected School and Expected Student Sample Sizes[1/]

Population To Be Assessed	Planned[1/] No. of Schools in the Sample	Selected No. of Schools in the Sample	Planned[2/] No. of Students in the Sample	Expected[3/] No. of Students in the Sample
9-year-olds	500	552	25,000	23,644
Sixth graders	1,000	960	50,000	49,288
13-year-olds	400	417	10,000	10,269
17-year-olds	400	388	10,000	10,130
Eleventh graders	400	408	20,000	19,976
Total	2,300[4/]	2,234[4/]	115,000	113,307

[1/]The schools and students of the "small" school sample are included in the counts of table 9.

[2/]From table 1.

[3/]The expected student sample sizes are based on the data on enrollment of school sampling frames.

[4/]The total planned and selected numbers of schools in the sample account for the duplication of a sample school being in more than one assessment. Consequently, these figures are not the column totals.

Tables A-1 to A-5 of appendix A break down the total school and student sample sizes by each of the primary stratum of each of the populations assessed. Tables A-1 to A-5 also provide the school and student population counts of each primary stratum for each population assessed.

Table 10 gives a profile of the percentages in the sample of the school district, schools, and students in all TAP populations by the ESC regions. Observe from table 10 that 70 percent of the 1,126 Texas school districts are presented in the TAP sample and that every ESC region has at least 60 percent of its school districts represented in the TAP sample.

Statewide, about 44 percent of the schools in the population assessed are represented in the TAP sample. As expected, a wide range of the percent of schools represented in the ESC regions exists from a low of 22 percent in ESC region 4 to a high of 72 percent in ESC region 19. This result is no surprise and is due to requirements that the results having equal sampling errors be reported for each ESC region. Statewide, about 13 percent of the students in all of the TAP populations are represented in the sample. Again as expected, in order to meet the requirement that the results have equal sampling errors for each of the ESC regions, the range of representation in each region is quite varied from a low of 4 percent in ESC region 4 to a high of 40 percent in ESC region 9.

Table 11 provides a comparison of the distribution of the total number of students in the sample and population of all the TAP student

Table 10

Population and Sample Numbers of School Districts, Schools, and Students, With Sample Percentages, by ESC Region

ESC Region Code	Location of ESC	School Districts			Schools			Students		
		Population	Sample		Population	Sample		Population	Sample	
		No.	No.	Percent	No.	No.	Percent	No.	No.	Percent
1	Edinburg	39	31	79.5	228	116	50.9	43847	5598	12.8
2	Corpus Christi	44	34	77.3	203	110	54.2	32254	5727	17.8
3	Victoria	43	36	83.7	142	94	66.2	17140	5454	31.8
4	Houston	56	38	67.9	660	148	22.4	170551	6935	4.1
5	Beaumont	30	29	96.7	159	98	61.6	29621	5949	20.1
6	Huntsville	60	47	78.3	173	107	61.8	23853	5326	22.3
7	Kilgore	102	65	63.7	318	123	38.7	40338	5573	13.8
8	Mt. Pleasant	52	39	75.0	150	98	65.3	15999	5415	33.8
9	Wichita Falls	40	30	75.0	133	86	64.7	13166	5368	40.8
10	Richardson	81	44	54.3	597	150	25.1	117330	6743	5.7
11	Fort Worth	83	50	60.2	410	134	32.7	69405	5850	8.4
12	Waco	85	56	65.9	264	118	44.7	29077	5468	18.8
13	Austin	62	43	69.4	262	109	41.6	41911	5404	12.9
14	Abilene	56	40	71.4	157	106	67.5	14554	5318	36.5
15	San Angelo	49	37	75.5	137	88	64.2	13646	5386	39.5
16	Amarillo	76	49	64.5	226	117	51.8	23534	5506	23.4
17	Lubbock	66	49	74.2	236	115	48.7	26719	5486	20.5
18	Midland	37	26	70.3	166	101	60.8	22192	5382	24.3
19	El Paso	13	11	84.6	123	89	72.4	33711	5588	16.6
20	San Antonio	52	34	65.4	370	127	34.3	75172	5831	7.8
Total		1126	788	70.0	5114	2234	43.7	854020	113307	13.3

Table 11

Percentages of the Total Student Population and Sample of All TAP Populations in the Sample by ESC Region

ESC Region Code	Location of ESC	No. of Students		Percent of Total	
		In Population	In Samples	In Population	In Samples
1	Edinburg	43847	5598	5.1	4.9
2	Corpus Christi	32254	5727	3.8	5.1
3	Victoria	17140	5454	2.0	4.8
4	Houston	170551	6935	20.0	6.1
5	Beaumont	29621	5949	3.5	5.3
6	Huntsville	23853	5326	2.8	4.7
7	Kilgore	40338	5573	4.7	4.9
8	Mt. Pleasant	15999	5415	1.9	4.8
9	Wichita Falls	13166	5368	1.5	4.7
10	Richardson	117330	6743	13.7	6.0
11	Fort Worth	169405	5850	8.1	5.1
12	Waco	29077	5468	3.4	4.8
13	Austin	41911	5404	4.9	4.8
14	Abilene	14554	5318	1.7	4.7
15	San Angelo	13646	5386	1.6	4.8
16	Amarillo	23534	5506	2.8	4.9
17	Lubbock	26719	5486	3.1	4.8
18	Midland	22192	5382	2.6	4.8
19	El Paso	33711	5588	4.0	4.9
20	San Antonio	75172	5831	8.8	5.1
Total		854020	113307	100.0	100.0

populations assessed across the 20 ESC regions. As expected, the sample distribution differs considerably from the population distribution. However, the sampling errors of sample estimates from the ESC regions will not differ by much since the prime determinant of sample precision (see figure 1) is the absolute number of students in the sample and not the percent of the population in the sample.

The percentage of the total sample in each ESC region is nearly the same since the sample was designed to achieve this characteristic. The highest percentage of ESC regions 4 and 10 reflect the oversampling of the black population done in these ESC regions. In the analysis of the TAP data, the disproportionate sampling across the ESC regions will be accounted for by each student's response being weighted in accordance with the number of students they represent in the population; e.g., a typical sample age 13-year-olds responding to an assessment item in ESC region 4 represents about 61 students in the population, whereas, a typical 13-year-old responding to a TAP item in ESC region 9 represents about 5 students.

Tables A-6 to A-10 to appendix A provide the population counts and sample sizes for the schools and students for each of the ESC regions and populations assessed by TAP. These tables also provide the number of black and Mexican-American students in the population and sample by each ESC region and population assessed by TAP.

Table 12 gives a comparison of the distribution of all the TAP student populations and samples for selected reporting variables. Tables A-11, A-12, and A-13 of appendix A give the number of schools and expected number of students in the population and sample for each

Table 12

Population and Sample Total Numbers of Students Over All Ages and Grades Assessed, by District Type, District Average Daily Attendance, District Per-Pupil Expenditure, and Ethnic Reporting Group, With Percentages of Overall Totals

Reporting Variable	Classification	Number of Students		Percent of Total		
		Population	Sample	Population		Sample
District Type	1. Major Urban	214,426	16,400	22.7	>	14.5
	2. Other Central Cities	114,752	20,131	12.1		17.8
	3. Suburban	284,563	18,625	30.1	>	16.4
	4. Nonmetropolitan	285,239	48,886	30.1		43.1
	5. Rural	47,432	9,265	5.0		8.2
District Average Daily Attendance	1. 50,000 & over	200,357	14,232	21.2	>	12.6
	2. 10,000-49,999	320,042	33,812	33.8	>	29.8
	3. 3,000-9,999	185,221	21,066	19.6		18.6
	4. 500-2,999	199,879	36,167	21.1		31.9
	5. Under 500	40,913	8,030	4.3		7.1
District Per Pupil Expenditure ($)	1. Under 700	98,871	12,205	10.5		10.8
	2. 700-799	138,890	15,994	14.7		14.1
	3. 800-899	352,717	38,275	37.4	>	33.8
	4. 900-999	135,391	21,249	14.4		18.8
	5. 1,000 & over	261,127	25,584	22.9		22.6
Ethnicity Group	1. Black	115,144	17,085	12.2		15.1
	2. Mexican-American	199,086	28,193	21.0		24.9
	3. Other	63,182	68,029	66.8	>	60.0

of the five populations assessed for the reporting variables of district type, district per-pupil expenditure, and district average daily attendance (ADA), respectively. Observe that all ethnic groups and district per-pupil expenditure groups have nearly equal representation in the population and sample. This is due primarily to oversampling of these groups and their distribution between and within the ESC region. For the district types and district ADA groups, this conclusion does not hold. The reason for the difference between the sample and population for these latter reporting variables is clear-cut and of no surprise due to the TAP sample design restriction of reporting results for each ESC region. However, as mentioned earlier, the results from these groups will not be biased because the assessment data will be analyzed with the appropriate weighting methods.

It is of interest to note the reason for the undersampling of the students in the major urban school district as constrasted to oversampling of the students in the "nonmetropolitan" school districts. The major urban school districts are located in ESC regions 2, 4, 10, 11, 13, 19, and 20 (see table 4). However, these same ESC regions have nonmetropolitan school districts which illustrate the sampling dilemma that "you cannot over/undersample everything," because if the students in the major urban districts were oversampled within a given ESC region, the students of the nonmetropolitan districts of that ESC region would have been undersampled. In the sampling of future assessments, thought should be

given to which group should be given priority for oversampling within an ESC region.

VIII. Weighting Procedure for the TAP Sample Design for Analysis of the Assessment Data

Appendix C provides the sample design parameters and weight equations for the TAP sample design. While the sample selection procedure gave every eligible student in each of the assessed populations a positive probability of selection, all of the probabilities for each assessment instrument sample in each assessed population are not the same due to the oversampling and undersampling of certain groups. To obtain unbiased sample estimates, this condition requires that each sample response be weighted by the inverse of each student's selected probability. In addition, although all of the students of the simple random sample in each sample school are to be tested, some students will be absent on the day of the assessment or otherwise not available for testing. It will therefore be be necessary to adjust the student weights for this nonresponse. Equation 1 of appendix C gives the weighting procedure in terms of the sample design parameters along with school and student nonresponse adjustment factors.

Table 13 gives the range of expected student weights of each final stratum of the TAP sample design for each ESC region and the "super" regions of the "small" school strata in terms of the minimum and maximum expected student weights. The expected student weight for each final stratum is the average of the expected student weight

Table 13

Range of Expected Student Weights of Final Stratified TAP Sample Design by ESC Region and Age/Grade

ESC Region Code	Population Age 9 Min	Age 9 Max	Age 13 Min	Age 13 Max	Age 17 Min	Age 17 Max	Grade 6 Min	Grade 6 Max	Grade 11 Min	Grade 11 Max
1	15	20	15	34	6	26	14	23	7	33
2	8	14	11	20	2	17	11	17	3	26
3	3	9	4	11	3	12	3	15	3	16
4	21	67	19	90	18	83	28	85	13	102
5	7	12	4	16	1	19	5	21	3	22
6	4	18	6	17	3	14	6	19	6	14
7	6	25	9	29	2	22	7	28	1	28
8	3	10	3	12	3	11	3	10	5	13
9	2	7	2	9	2	9	2	10	3	13
10	7	53	8	72	4	52	14	66	6	71
11	15	26	22	30	19	44	17	35	26	46
12	6	32	9	20	4	23	8	18	5	30
13	8	19	15	30	7	21	8	35	10	28
14	3	6	2	12	1	7	3	10	6	11
15	2	6	5	11	5	14	3	8	2	11
16	5	12	8	14	3	14	7	12	5	20
17	5	15	8	16	5	14	7	22	4	19
18	6	13	7	16	4	15	6	13	6	20
19	9	21	12	20	3	23	11	17	5	28
20	20	31	22	51	13	31	21	45	29	42
				(Small Schools)						
(Super Region)										
1	22	23	17	18	8	22	9	21	8	22
2	15	16	20	21	12	13	16	16	12	13
3	17	18	17	18	15	16	16	17	15	16
4	28	29	20	21	8	22	11	25	8	22
5	23	23	18	16	16	16	21	22	16	16
All	2	67	2	72	1	52	2	85	1	102

of the selected sample schools of each final stratum. Note the expected student weights range from 1 to 102 students (see table 13); e.g., some responding students represent as many as 102 students in the population. Tables B-1 to B-5 of appendix B give the number of schools in the population, sample number of schools per assessment instrument (package), and the expected student weight for all final strata of the age nine, age thirteen, age seventeen, grade six, and grade eleven populations, respectively.

Equation 2 of appendix C provides the equation to estimate the percentage correct of an item using the weighting procedure of the TAP sample design. Equation 3 of appendix C provides the sampling error model in terms of the complexities of the sample design. This equation is used in the analysis of the assessment data instead of the sampling error model of figure 1. The sampling error model of figure 1 is used primarily for planning a complex sample. Also note the sampling error model of equation 3 of appendix C takes into account the finite population correction factor at the school and student stages of sampling.

A sample survey computational system has been developed at RTI that uses the methodology of appendix C to produce sample estimates and their sampling errors in a cost-effective fashion.

APPENDIX A

TABLES FOR TEXAS ASSESSMENT PROJECT SAMPLE DESIGN REPORT

Table A1
Age 9 Population and Sample Numbers of Schools and
Expected Total Students, by Primary Stratum

Primary Stratum	Schools		Students		Primary Stratum	Schools		Students		Primary Stratum	Schools		Students	
	Pop.	Sample	Pop.	Sample		Pop.	Sample	Pop.	Sample		Pop.	Sample	Pop.	Sample
1.1	52	9	3734	435	8.1	10	4	561	196	15.1	20	8	903	364
1.2	41	7	2480	306	8.2	42	17	2181	816	15.2	37	14	1679	619
1.3	41	7	3108	350	8.3	29	5	518	165	15.3	22	4	339	135
1.4	19	3	1045	98	9.1	22	9	911	381	16.1	33	10	1775	472
2.1	44	11	2441	486	9.2	48	17	1487	700	16.2	33	8	1562	339
2.2	27	7	1861	343	10.1	148	13	9339	594	16.3	61	9	1253	311
2.3	45	9	1936	392	10.2	159	13	11874	616	17.1	39	9	1935	381
3.1	31	10	1237	437	10.3	75	6	2981	171	17.2	48	11	2531	502
3.2	12	5	642	202	11.1	59	8	4300	400	17.3	38	9	956	276
3.3	36	13	1271	468	11.2	89	10	5883	491	18.1	19	5	878	221
4.1	179	15	13754	669	11.3	96	10	3658	356	18.2	36	12	1864	524
4.2	192	12	18025	598	12.1	52	13	2900	603	18.3	46	10	1591	374
4.3	53	3	3738	150	12.2	42	7	1655	286	19.1	48	13	3741	637
5.1	24	7	1448	327	12.3	48	8	1148	218	19.2	28	10	2688	469
5.2	25	9	1937	450	13.1	56	10	3542	469	19.3	10	2	487	73
5.3	37	10	2132	429	13.2	18	4	1416	200	20.1	66	7	4057	350
6.1	19	9	1611	438	13.3	18	3	867	112	20.2	55	6	3974	300
6.2	35	13	2457	560	13.4	25	4	1097	157	20.3	51	6	3838	295
6.3	27	7	567	167	13.5	21	5	1116	207	20.4	61	10	3338	328
7.1	26	5	1548	209	14.1	21	9	1078	409					
7.2	80	17	5089	765	14.2	23	8	734	302					
7.3	55	7	1364	168	14.3	40	11	983	378	Total	2992	552	173043	23644

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Table A2

Age 13 Population and Sample Numbers of Schools and Expected Total Students, by Primary Stratum

Primary Stratum	Schools		Students		Primary Stratum	Schools		Students		Primary Stratum	Schools		Students	
	Pop.	Sample	Pop.	Sample		Pop.	Sample	Pop.	Sample		Pop.	Sample	Pop.	Sample
1.1	9	7	3561	175	8.1	3	3	606	75	15.1	4	4	997	100
1.2	12	7	2695	153	8.2	25	12	2380	300	15.2	27	10	1723	275
1.3	22	5	3120	125	8.3	27	5	545	113	15.3	23	3	373	74
1.1	11	2	1087	47	9.1	8	5	1038	165	16.1	10	7	2033	175
2.2	16	8	3101	191	9.2	40	15	1844	354	16.2	22	7	1785	175
2.3	13	6	2060	150	10.1	33	10	9915	275	16.3	53	7	1473	156
2.4	31	6	2327	150	10.2	52	9	12440	225	17.1	12	7	2242	175
3.1	18	8	1559	200	10.3	66	4	3487	115	17.2	32	9	2752	225
3.2	11	4	785	100	11.1	20	6	4607	150	17.3	31	5	1103	113
3.3	24	8	1466	200	11.2	34	9	6667	225	18.1	3	3	1089	75
4.1	46	11	14586	300	11.3	64	7	4007	142	18.2	18	9	2161	225
4.2	76	11	19662	276	12.1	19	10	3261	250	18.3	28	8	1787	192
4.3	32	2	4217	50	12.2	38	6	2045	150	19.1	26	11	4036	275
5.1	11	6	1665	150	12.3	38	6	1323	125	19.2	17	7	2844	175
5.2	12	7	2346	175	13.1	12	9	4004	225	19.3	9	3	448	60
5.3	26	9	2360	215	13.2	12	3	1688	75	20.1	23	5	4316	125
6.1	8	6	1913	150	13.3	15	2	969	50	20.2	22	6	4309	126
6.2	30	11	2907	253	13.4	21	3	1332	71	20.3	21	5	4654	125
6.3	27	4	628	100	13.5	17	3	1297	75	20.4	39	6	3647	126
7.1	10	4	1664	100	14.1	7	6	1316	150					
7.2	56	12	5645	297	14.2	20	5	857	125					
7.3	57	6	1555	120	14.3	33	7	1138	175	TOTAL	1582	417	191447	10269

Table A3
Age 17 Population and Sample Numbers of Schools and
Expected Total Students, by Primary Stratum

Primary Stratum	Schools		Students		Primary Stratum	Schools		Students		Primary Stratum	Schools		Students	
	Pop.	Sample	Pop.	Sample		Pop.	Sample	Pop.	Sample		Pop.	Sample	Pop.	Sample
1.1	6	6	2160	150	8.1	4	2	610	75	15.1	3	2	807	100
1.2	6	3	1799	100	8.2	23	14	2101	350	15.2	23	12	1290	338
1.3	13	6	1995	150	8.3	17	2	321	45	15.3	20	3	314	47
1.4	10	4	782	100	9.1	7	5	1162	182	16.1	7	6	1927	198
2.1	11	8	2774	201	9.2	37	11	1645	296	16.2	19	6	1440	149
2.2	11	6	1575	149	10.1	32	11	8584	300	16.3	39	7	1243	158
2.3	21	6	1758	150	10.2	27	10	10472	249	17.1	7	5	1808	200
3.1	12	6	1431	197	10.3	58	4	2809	75	17.2	31	8	2015	197
3.2	11	4	752	100	11.1	17	6	4158	150	17.3	31	6	876	119
3.3	14	8	1261	188	11.2	24	10	5922	235	18.1	2	2	1097	100
4.1	35	12	11263	278	11.3	51	7	3375	159	18.2	9	6	1743	200
4.2	49	10	16039	245	12.1	11	8	2709	250	18.3	26	7	1456	167
4.3	26	2	3358	50	12.2	34	5	1712	121	19.1	9	8	3634	250
5.1	8	6	1815	200	12.3	33	5	1110	102	19.2	8	7	2521	200
5.2	9	8	2304	200	13.1	10	8	3384	200	19.3	8	2	331	43
5.3	23	6	1949	146	13.2	8	4	1492	100	20.1	10	5	3363	116
6.1	5	4	1556	135	13.3	13	2	810	37	20.2	16	4	3131	100
6.2	28	10	2365	200	13.4	18	3	1153	75	20.3	13	8	4439	181
6.3	25	5	518	111	13.5	15	3	1163	66	20.4	33	4	2630	100
7.1	4	4	1570	98	14.1	4	2	1081	100					
7.2	49	13	5044	302	14.2	17	7	752	169					
7.3	46	6	1289	131	14.3	31	8	963	200	TOTAL	1227	388	158910	10130

A-3

Table A4
Grade 6 Population and Sample Numbers of Schools and
Expected Total Students, by Primary Stratum

Primary Stratum	Schools		Students		Primary Stratum	Schools		Students		Primary Stratum	Schools		Students	
	Pop.	Sample	Pop.	Sample		Pop.	Sample	Pop.	Sample		Pop.	Sample	Pop.	Sample
1.1	38	16	3870	781	8.1	8	7	743	399	15.1	16	12	1091	686
1.2	31	12	2927	606	8.2	26	22	2699	1545	15.2	32	21	2093	1392
1.3	34	15	3703	749	8.3	28	14	698	465	15.3	22	11	458	347
1.4	13	7	1315	290	9.1	20	16	1106	773	16.1	32	18	2217	855
2.1	43	21	3176	1010	9.2	40	24	2097	1559	16.2	30	18	2076	874
2.2	18	12	2377	700	10.1	98	28	11890	1314	16.3	59	21	1651	692
2.3	35	15	2802	791	10.2	104	23	14561	1105	17.1	39	18	2681	843
3.1	17	12	1858	990	10.3	67	11	4057	432	17.2	34	19	3327	1029
3.2	11	9	867	454	11.1	16	11	5640	781	17.3	33	12	1321	462
3.3	29	17	1760	956	11.2	75	20	7579	1000	18.1	19	12	1355	584
4.1	175	26	17489	1410	11.3	75	17	4600	667	18.2	33	21	2283	986
4.2	86	25	22990	1302	12.1	26	18	3597	1149	18.3	38	16	1968	821
4.3	36	7	4807	306	12.2	35	16	2377	778	19.1	47	27	4934	1400
5.1	18	13	1977	793	12.3	39	14	1537	507	19.2	28	17	3292	879
5.2	12	12	2658	876	13.1	9	8	4643	800	19.3	8	5	511	134
5.3	30	15	2742	842	13.2	13	9	1970	497	20.1	21	12	5311	581
6.1	6	6	2175	607	13.3	18	7	1128	287	20.2	44	16	5573	800
6.2	30	21	3406	1279	13.4	20	9	1519	373	20.3	25	14	5360	610
6.3	27	12	738	366	13.5	17	7	1514	375	20.4	51	13	4249	573
7.1	19	10	1914	499	14.1	22	17	1489	950					
7.2	63	28	6577	1480	14.2	22	12	977	537					
7.3	55	13	1780	461	14.3	36	22	1314	899	TOTAL	2251	960	233663	49288

Table A5
Grade 11 Population and Sample Numbers of Schools and
Expected Total Students, by Primary Stratum

Primary Stratum	Schools		Students		Primary Stratum	Schools		Students		Primary Stratum	Schools		Students	
	Pop.	Sample	Pop.	Sample		Pop.	Sample	Pop.	Sample		Pop.	Sample	Pop.	Sample
1.1	6	6	2634	300	8.1	4	2	759	150	15.1	3	2	995	200
1.2	5	3	2258	200	8.2	23	14	2647	670	15.2	22	12	1590	618
1.3	13	6	2470	300	8.3	17	2	394	51	15.3	20	4	377	91
1.4	10	4	993	183	9.1	7	4	1444	350	16.1	7	6	2423	393
2.1	11	8	3430	405	9.2	37	11	2060	598	16.2	18	6	1794	292
2.2	11	6	1926	300	10.1	32	11	11152	578	16.3	39	7	1576	267
2.3	21	7	2216	309	10.2	27	10	13177	500	17.1	7	5	2256	400
3.1	12	6	1736	383	10.3	58	7	3595	194	17.2	31	8	2533	400
3.2	11	4	916	179	11.1	17	6	5147	300	17.3	31	5	1100	164
3.3	14	8	1566	400	11.2	24	9	7328	450	18.1	2	2	1392	200
4.1	35	12	14112	551	11.3	51	11	4318	344	18.2	9	6	2223	400
4.2	49	10	20247	600	12.1	11	8	3419	500	18.3	25	9	1847	313
4.3	26	2	4236	150	12.2	34	8	2102	251	19.1	8	8	4416	500
5.1	8	7	2324	405	12.3	33	6	1344	178	19.2	8	7	3098	377
5.2	9	8	2796	400	13.1	10	8	4484	400	19.3	8	4	433	116
5.3	23	8	2396	341	13.2	8	4	1892	200	20.1	10	4	4201	250
6.1	5	3	2016	250	13.3	13	2	1026	94	20.2	16	4	3964	200
6.2	28	10	2943	478	13.4	18	4	1430	133	20.3	13	7	5416	331
6.3	25	6	673	182	13.5	15	3	1476	126	20.4	33	5	3220	214
7.1	4	4	1973	171	14.1	4	2	1348	200					
7.2	48	12	6316	576	14.2	17	7	942	338					
7.3	46	6	1619	196	14.3	31	11	1215	386	TOTAL	1221	408	198601	19976

Table A6
Age 9 Population and Sample Numbers of Schools and Expected Total, Black, and Mexican-American Students by ESC Region

Region	Schools		Students					
			Total		Black		Mexican-American	
	Population	Sample	Population	Sample	Population	Sample	Population	Sample
1	153	26	10367	1189	13	2	9279	1057
2	116	27	6238	1221	206	25	3950	806
3	79	28	3150	1107	418	127	1151	404
4	424	30	35517	1417	8495	527	5596	203
5	86	26	5517	1206	1523	303	118	24
6	81	29	4635	1165	4079	260	264	93
7	161	29	8001	1142	2358	403	154	16
8	81	26	3260	1177	885	352	11	6
9	70	26	2398	1081	213	71	189	86
10	382	32	24194	1381	5482	460	2334	63
11	244	28	13841	1247	1783	171	1132	113
12	142	28	5703	1107	1117	185	593	122
13	138	26	8038	1145	972	133	2215	358
14	84	28	2795	1089	173	64	625	226
15	79	26	2921	1118	121	42	1134	407
16	127	27	4590	1122	250	52	912	228
17	125	29	5422	1159	466	65	2127	526
18	101	27	4333	1119	267	50	1504	415
19	86	25	6916	1179	177	44	4818	786
20	233	29	15207	1273	961	99	8841	658
Total	2992	552	173043	23644	26959	3435	46947	6597

Table A7

Age 13 Population and Sample Numbers of Schools and Expected Total, Black, and Mexican American Students by ESC Region

Region	Schools		Students					
			Total		Black		Mexican-American	
	Population	Sample	Population	Sample	Population	Sample	Population	Sample
1	54	21	10463	500	110	4	8883	424
2	60	20	7488	491	276	17	4434	314
3	53	20	3810	500	515	70	1235	160
4	154	24	38465	626	9415	244	5090	76
5	49	22	6371	540	1712	131	127	9
6	65	21	5448	503	1209	128	316	31
7	123	22	8864	517	2361	134	257	14
8	55	20	3531	488	913	126	16	2
9	48	20	2882	529	234	33	189	25
10	151	23	25842	615	5759	232	1999	45
11	118	22	15281	517	1873	92	1029	33
12	95	22	6629	525	1208	109	651	54
13	77	20	9290	496	1118	55	2342	106
14	60	18	3311	450	188	28	586	83
15	54	17	3093	449	118	18	1108	142
16	85	21	5291	506	241	25	848	72
17	75	21	6097	513	538	37	2129	182
18	49	20	5037	492	281	24	1457	134
19	52	21	7328	510	206	14	4799	315
20	105	22	16926	502	1090	18	9155	320
Total	1582	417	191447	10269	29365	1539	46650	2541

Table A8

Age 17 Population and Sample Numbers of Schools and Expected Total, Black, and Mexican-American Students by ESC Region

Region	Schools		Students					
			Total		Black		Mexican-American	
	Population	Sample	Population	Sample	Population	Sample	Population	Sample
1	35	19	6736	500	8	1	5489	395
2	43	20	6107	500	243	23	3054	252
3	37	18	3444	485	456	70	765	116
4	110	24	30660	573	6572	204	2558	38
5	40	20	6068	546	1571	159	133	12
6	58	19	4439	496	956	138	157	15
7	99	23	7903	531	1943	146	44	4
8	44	18	3032	470	774	129	10	1
9	44	16	2807	478	208	31	118	18
10	117	25	21865	624	4264	200	1099	24
11	92	23	13445	544	1421	38	525	22
12	78	18	5531	473	947	74	323	31
13	64	20	8002	478	853	71	1380	85
14	52	17	2796	469	130	21	261	46
15	46	17	2411	485	81	14	573	99
16	65	19	4610	505	191	20	367	36
17	69	19	4699	516	401	53	950	120
18	37	15	4296	467	255	27	838	119
19	25	17	6486	493	189	13	3890	303
20	72	21	13563	497	863	31	6019	198
Total	1227	388	158910	10130	22326	1463	28553	1934

Table A9
Grade 6 Population and Sample Numbers of Schools and Expected Total, Black, and Mexican-American Students by ESC Region

Region	Schools		Students					
			Total		Black		Mexican-American	
	Population	Sample	Population	Sample	Population	Sample	Population	Sample
1	116	50	11815	2426	22	6	10343	2114
2	96	48	8355	2501	305	69	5220	1598
3	57	38	4485	2400	661	373	1516	811
4	297	58	45286	3018	11319	1169	6562	300
5	60	40	7646	2511	2229	844	199	75
6	63	39	6319	2252	1523	581	427	131
7	137	51	10271	2440	2841	834	212	66
8	62	43	4140	2409	1084	634	23	13
9	60	40	3203	2332	261	234	240	182
10	269	62	30508	2851	7157	1008	2726	233
11	166	49	17819	2448	2401	329	1304	150
12	100	48	7511	2434	1338	453	778	245
13	77	40	10774	2332	1355	302	2878	669
14	80	51	3780	2386	245	173	745	479
15	70	44	3642	2425	131	70	1362	879
16	121	57	5944	2421	311	119	1110	487
17	106	49	7329	2334	697	217	2781	915
18	90	49	5606	2391	372	207	1841	797
19	83	49	8737	2413	264	58	5804	1633
20	141	55	20493	2564	1304	145	11616	1450
Total	2251	960	223663	49288	35820	7825	57687	13227

Table A10

Grade 11 Population and Sample Numbers of Schools and Expected Total, Black, and Mexican-American Students by ESC Region

Region	Schools		Students					
			Total		Black		Mexican-American	
	Population	Sample	Population	Sample	Population	Sample	Population	Sample
1	34	19	8355	983	16	1	6807	809
2	43	21	7572	1014	327	37	3825	531
3	37	18	4218	962	580	133	954	214
4	110	24	38595	1301	8276	497	3381	78
5	40	23	7516	1146	1981	298	184	26
6	58	19	5632	910	1184	232	221	36
7	98	22	9908	943	2392	255	62	4
8	44	18	3800	871	987	210	12	3
9	44	15	3504	948	278	66	171	46
10	117	28	27924	1272	5766	343	1469	59
11	92	26	16793	1094	1791	90	718	50
12	78	22	6865	929	1191	173	435	53
13	64	21	10308	953	1147	117	1867	205
14	52	20	3505	924	188	41	346	87
15	45	18	2962	909	111	28	747	178
16	64	19	5793	952	257	43	495	87
17	69	18	5889	964	539	101	1240	214
18	36	17	5462	913	329	53	1103	203
19	24	19	7947	993	215	22	4825	586
20	72	21	16801	995	1106	83	7672	425
Total	1221	408	199349	19976	28669	2823	36534	3894

Table A11
Population and Sample Numbers of Schools and Expected Total Sudents
by School District Type and Age/Grade

District Type	Age 9				Grade 6			
	Schools		Students		Schools		Students	
	Population	Sample	Population	Sample	Population	Sample	Population	Sample
Major Urban	573	74	39866	3510	394	131	51754	7096
Other Central Cities	378	97	21098	4337	294	165	26234	8818
Suburban	644	80	51632	3919	402	149	66820	7976
Non-Metropolitan	892	238	51829	10459	665	367	67903	21511
Rural	505	63	8618	1419	496	148	11552	3887
Total	2992	552	173043	23644	2251	960	223663	46618
	Age 13				Grade 11			
Major Urban	164	60	42777	1541	117	53	45016	2783
Other Central Cities	114	69	23337	1753	66	52	24536	3520
Suburban	260	63	57141	1552	167	66	60549	3458
Non-Metropolitan	554	173	58227	4350	484	165	59638	8349
Rural	490	52	9965	1073	387	72	9610	1866
Total	1582	417	191447	10269	1221	408	199349	19976
	Age 17							
Major Urban	118	57	35613	1470				
Other Central Cities	67	48	19547	1703				
Suburban	167	69	48421	1720				
Non-Metropolitan	487	163	47642	4217				
Rural	388	51	7687	1020				
Total	1227	388	158910	10130				

Table A12
Population and Sample Numbers of Schools and Expected Total Students
by District Annual Per Pupil Expenditure and Age/Grade

Per Pupil Expenditure	Age 9				Grade 6			
	Schools		Students		Schools		Students	
	Population	Sample	Population	Sample	Population	Sample	Population	Sample
Under $700	290	60	20168	2830	243	109	24607	5239
$700 - 799	430	75	26064	3123	316	127	33026	7136
$800 - 899	1032	185	63734	8222	799	320	84368	16675
$900 - 999	416	98	23529	4463	302	171	31382	9393
$1000 and over	811	134	39242	5006	577	233	49783	10845
No data	13	0	306	0	14	0	497	0
Total	2992	552	173043	23644	2251	960	223663	49288
	Age 13				Grade 11			
Under $700	167	43	21312	1075	116	42	18229	2068
$700 - 799	243	59	28470	1479	192	58	28669	2816
$800 - 899	465	129	70311	3243	329	129	74396	6735
$900 - 999	221	80	26078	1970	178	66	30250	3545
$1000 and over	472	106	45078	2502	392	113	45923	4812
No data	14	0	198	0	14	0	1882	0
Total	1582	417	191447	10269	1221	408	199349	19976
	Age 17							
Under $700	116	39	14555	993				
$700 - 799	194	57	22661	1440				
$800 - 899	330	126	59908	3400				
$900 - 999	178	68	24152	1878				
$1000 and over	394	98	36101	2419				
No data	15	0	1533	0				
Total	1227	388	158910	10130				

Table A13
Population and Sample Numbers of Schools and Expected Total Students
by District Average Daily Attendance and Age/Grade

ADA	Age 9				Grade 6			
	Schools		Students		Schools		Students	
	Population	Sample	Population	Sample	Population	Sample	Population	Sample
50000 and over	531	63	37565	3024	352	111	48175	6136
10000 - 49999	828	153	58165	7080	609	282	74039	14860
3000 - 9999	484	110	33940	4989	290	145	43989	9229
500 - 2999	647	167	35976	7535	505	272	47530	15654
Under 500	502	59	7397	1016	495	150	9930	3409
Total	2992	552	173043	23644	2251	960	223663	49288
	Age 13				Grade 11			
50000 and over	149	52	39860	1350	107	46	41762	2428
10000 - 49999	285	118	64627	2946	163	97	68451	5935
3000 - 9999	183	75	37600	1926	120	60	38804	3372
500 - 2999	467	124	40857	3097	442	135	41958	6621
Under 500	498	48	8503	950	389	70	8374	1620
Total	1582	417	191447	10269	1221	408	199349	19976
	Age 17							
50000 and over	108	50	32995	1294				
10000 - 49999	164	98	54760	2991				
3000 - 9999	122	57	30888	1550				
500 - 2999	443	131	33558	3260				
Under 500	390	52	6709	1035				
Total	1227	388	158910	10130				

Table A14

Sample Design Paramaters To Select Subsample For Writing Mechanics Essay

Schools	Age 9		Age 13		Age 17	
	Regular	Small	Regular	Small	Regular	Small
Number in Basic Sample	508	22	396	21	368	20
Number Selected for Subsample	35	5	35	5	35	5
Sampling Interval and Weight Factor	14.514	4.400	11.314	4.200	10.514	4.000
Random Start	8.889	1.916	0.262	3.174	8.513	1.211

APPENDIX B

TABLES FOR TEXAS ASSESSMENT PROJECT SAMPLE DESIGN REPORT

TABLE B-1, NUMBERS OF SCHOOLS IN POPULATION, SAMPLE NUMBERS PER PACKAGE, AND EXPECTED STUDENT WEIGHTS, TAP SAMPLE DESIGN FINAL STRATA, AGE 9

FINAL STRATUM CODE	REGION CODE	PRIMARY STRATUM CODE	SUB-STRATUM CODE	OVER-SAMPLING	NO. SCH. IN STRATUM	SAMPLE NO. PER PACKAGE	EXPECTED STUDENT WEIGHT
205	17	3	1	0	7	3	5,351
206	17	3	2	0	9	2	9,000
207	18	1	1	0	10	3	7,022
208	18	1	2	0	9	2	9,000
209	18	2	1	0	6	3	7,573
210	18	2	2	0	4	2	5,760
211	18	2	3	0	5	2	6,400
212	18	2	4	0	7	2	7,770
213	18	2	5	0	9	2	9,000
214	18	3	1	0	6	3	6,053
215	18	3	2	0	6	2	7,440
216	18	3	3	0	10	2	10,000
217	18	3	4	0	13	2	13,000
218	19	1	1	0	6	3	11,493
219	19	1	2	0	6	2	13,020
220	19	1	3	0	6	2	11,820
221	19	1	4	0	7	2	9,450
222	19	1	5	0	10	2	11,400
223	19	1	6	0	12	2	12,000
224	19	2	1	0	3	2	11,340
225	19	2	2	0	3	2	10,530
226	19	2	3	0	5	2	10,200
227	19	2	4	0	6	2	9,840
228	19	2	5	0	10	2	10,000
229	19	3	1	0	8	2	20,960
230	20	1	1	0	19	3	23,475
231	20	1	2	0	17	2	20,740
232	20	1	3	0	29	2	31,610
233	20	2	1	0	13	2	25,610
234	20	2	2	0	17	2	26,860
235	20	2	3	0	25	2	29,250
236	20	3	1	0	10	2	30,200
237	20	3	2	0	15	2	26,700
238	20	3	3	0	22	2	27,720
239	20	4	1	0	9	2	23,490
240	20	4	2	0	14	2	21,140
241	20	4	3	0	27	2	28,080

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TABLE B-1. NUMBERS OF SCHOOLS IN POPULATION, SAMPLE NUMBERS PER PACKAGE, AND EXPECTED STUDENT WEIGHTS, TAP SAMPLE DESIGN FINAL STRATA, AGE 9

FINAL STRATUM CODE	REGION CODE	PRIMARY STRATUM CODE	SUB-STRATUM CODE	OVER-SAMPLING	NO. SCH. IN STRATUM	SAMPLE NO. PER PACKAGE	EXPECTED STUDENT WEIGHT
154	13	3	1	0	16	3	10,667
155	13	4	1	0	7	2	12,250
156	13	4	2	0	15	2	15,000
157	13	5	1	0	4	2	10,320
158	13	5	2	0	6	2	8,100
159	14	1	1	0	5	3	5,000
160	14	1	2	0	3	2	3,960
161	14	1	3	0	4	2	5,000
162	14	1	4	0	8	2	8,000
163	14	2	1	0	5	3	4,378
164	14	2	2	0	5	2	5,000
165	14	2	3	0	6	2	6,000
166	14	3	1	0	1	1	3,680
167	14	3	2	0	1	1	3,440
168	14	3	3	0	6	3	4,347
169	14	3	4	0	4	2	4,000
170	14	3	5	0	6	2	6,000
171	15	1	1	0	4	2	4,880
172	15	1	2	0	4	2	4,240
173	15	1	3	0	5	2	5,000
174	15	1	4	0	6	2	6,000
175	15	2	1	0	1	1	6,880
176	15	2	2	0	1	1	5,440
177	15	2	3	0	1	1	5,200
178	15	2	4	0	4	3	4,124
179	15	2	5	0	4	2	5,520
180	15	2	6	0	4	2	4,000
181	15	2	7	0	5	2	5,000
182	15	2	8	0	8	2	8,000
183	15	3	1	0	4	3	2,862
184	16	1	1	0	3	2	6,210
185	16	1	2	0	5	2	6,750
186	16	1	3	0	7	2	8,190
187	16	1	4	0	7	2	7,140
188	16	1	5	0	9	2	9,000
189	16	2	1	0	5	2	9,200
190	16	2	2	0	7	2	7,420
191	16	2	3	0	8	2	8,000
192	16	2	4	0	12	2	12,000
193	16	3	1	0	7	3	5,071
194	16	3	2	0	6	2	6,000
195	16	3	3	0	8	2	8,000
196	17	1	1	0	7	3	8,774
197	17	1	2	0	7	2	8,750
198	17	1	3	0	8	2	8,000
199	17	1	4	0	15	2	15,000
200	17	2	1	0	7	3	10,547
201	17	2	2	0	6	2	8,760
202	17	2	3	0	7	2	9,240
203	17	2	4	0	10	2	10,100
204	17	2	5	0	13	2	13,000

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TABLE B-1. NUMBERS OF SCHOOLS IN POPULATION, SAMPLE NUMBERS PER PACKAGE, AND EXPECTED STUDENT WEIGHTS, TAP SAMPLE DESIGN FINAL STRATA, AGE 9

FINAL STRATUM CODE	REGION CODE	PRIMARY STRATUM CODE	SUB-STRATUM CODE	OVER-SAMPLING	NO. SCH. IN STRATUM	SAMPLE NO. PER PACKAGE	EXPECTED STUDENT WEIGHT
103	9	2	3	0	3	2	4,140
104	9	2	4	0	1	1	2,440
105	9	2	5	0	1	1	2,400
106	9	2	6	0	3	2	3,420
107	9	2	7	0	3	2	3,030
108	9	2	8	0	4	2	4,000
109	9	2	9	0	4	2	4,000
110	9	2	10	0	7	2	7,000
111	10	1	1	1	12	3	21,867
112	10	1	2	1	5	2	7,900
113	10	1	3	1	19	2	22,420
114	10	1	4	0	21	2	41,370
115	10	1	5	0	30	2	39,600
116	10	1	6	0	53	2	53,000
117	10	2	1	0	16	2	36,160
118	10	2	2	0	19	2	40,280
119	10	2	3	0	23	2	39,790
120	10	2	4	0	28	2	40,600
121	10	2	5	0	30	2	37,200
122	10	2	6	0	42	2	44,520
123	10	3	1	0	52	3	49,458
124	11	1	1	0	9	2	22,950
125	11	1	2	0	11	2	18,700
126	11	1	3	0	15	2	22,050
127	11	1	4	0	23	2	25,760
128	11	2	1	0	11	2	20,790
129	11	2	2	0	14	2	25,480
130	11	2	3	0	18	2	25,380
131	11	2	4	0	19	2	23,750
132	11	2	5	0	25	2	26,000
133	11	3	1	0	14	3	15,929
134	11	3	2	0	17	2	20,910
135	11	3	3	0	32	2	32,000
136	12	1	1	0	7	3	10,298
137	12	1	2	0	5	2	7,700
138	12	1	3	0	7	2	9,240
139	12	1	4	0	8	2	8,880
140	12	1	5	0	9	2	9,000
141	12	1	6	0	12	2	12,000
142	12	2	1	0	8	3	7,431
143	12	2	2	0	10	2	10,000
144	12	2	3	0	14	2	14,000
145	12	3	1	0	8	3	6,542
146	12	3	2	0	9	2	9,000
147	13	1	1	0	7	2	14,490
148	13	1	2	0	8	2	13,760
149	13	1	3	0	9	2	12,420
150	13	1	4	0	12	2	14,280
151	13	1	5	0	19	2	19,000
152	13	2	1	0	6	2	13,080
153	13	2	2	0	11	2	15,290

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TABLE B-1. NUMBERS OF SCHOOLS IN POPULATION, SAMPLE NUMBERS PER PACKAGE, AND EXPECTED STUDENT WEIGHTS, TAP SAMPLE DESIGN FINAL STRATA, AGE 9

FINAL STRATUM CODE	REGION CODE	PRIMARY STRATUM CODE	SUB-STRATUM CODE	OVER-SAMPLING	NO. SCH. IN STRATUM	SAMPLE NO. PER PACKAGE	EXPECTED STUDENT WEIGHT
52	5	2	1	0	6	3	9,227
53	5	2	2	0	4	2	7,320
54	5	2	3	0	6	2	7,860
55	5	2	4	0	9	2	9,270
56	5	3	1	1	5	3	6,622
57	5	3	2	1	7	2	7,210
58	5	3	3	0	8	3	11,342
59	5	3	4	0	12	2	12,000
60	6	1	1	0	4	3	6,651
61	6	1	2	0	3	2	5,970
62	6	1	3	0	5	2	8,400
63	6	1	4	0	6	2	6,240
64	6	2	1	1	1	1	4,760
65	6	2	2	1	1	1	4,720
66	6	2	3	1	6	2	6,000
67	6	2	4	0	1	1	10,080
68	6	2	5	0	7	2	17,150
69	6	2	6	0	3	2	5,250
70	6	2	7	0	4	2	5,680
71	6	2	8	0	9	2	9,000
72	6	3	1	1	8	2	8,000
73	6	3	2	0	6	2	6,060
74	7	1	1	1	8	3	6,187
75	7	1	2	0	16	2	16,000
76	7	2	1	1	8	3	9,636
77	7	2	2	1	11	2	11,000
78	7	2	3	0	7	3	15,494
79	7	2	4	0	8	2	15,200
80	7	2	5	0	9	2	13,320
81	7	2	6	0	11	2	13,200
82	7	2	7	0	19	2	19,000
83	7	3	1	1	9	2	9,540
84	7	3	2	0	25	2	25,000
85	8	1	1	0	3	2	5,460
86	8	1	2	0	5	2	5,950
87	8	2	1	1	1	1	5,680
88	8	2	2	1	4	3	4,462
89	8	2	3	1	3	2	4,140
90	8	2	4	1	3	2	3,570
91	8	2	5	1	4	2	4,000
92	8	2	6	0	5	3	4,244
93	8	2	7	0	6	2	6,540
94	8	2	8	0	10	2	10,000
95	8	3	1	0	1	1	3,440
96	8	3	2	0	7	3	4,667
97	9	1	1	0	5	3	4,156
98	9	1	2	0	4	2	4,000
99	9	1	3	0	5	2	5,000
100	9	1	4	0	7	2	7,000
101	9	2	1	0	1	1	3,320
102	9	2	2	0	1	1	3,240

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TABLE B-1. NUMBERS OF SCHOOLS IN POPULATION, SAMPLE NUMBERS PER PACKAGE, AND EXPECTED STUDENT WEIGHTS, TAP SAMPLE DESIGN FINAL STRATA, AGE 9

FINAL STRATUM CODE	REGION CODE	PRIMARY STRATUM CODE	SUB-STRATUM CODE	OVER-SAMPLING	NO. SCH. IN STRATUM	SAMPLE NO. PER PACKAGE	EXPECTED STUDENT WEIGHT
1	1	1	1	0	10	3	15,378
2	1	1	2	0	9	2	15,660
3	1	1	3	0	11	2	16,280
4	1	1	4	0	20	2	20,000
5	1	2	1	0	8	2	13,840
6	1	2	2	0	11	2	15,840
7	1	2	3	0	16	2	18,560
8	1	3	1	0	8	3	17,209
9	1	3	2	0	9	2	16,290
10	1	3	3	0	20	2	26,400
11	1	4	1	0	17	3	14,431
12	2	1	1	0	5	2	8,450
13	2	1	2	0	7	2	10,640
14	2	1	3	0	7	2	9,590
15	2	1	4	0	9	2	10,350
16	2	1	5	0	12	2	12,000
17	2	2	1	0	8	3	10,702
18	2	2	2	0	8	2	11,040
19	2	2	3	0	11	2	11,330
20	2	3	1	0	3	2	9,270
21	2	3	2	0	5	2	9,300
22	2	3	3	0	7	2	8,190
23	2	3	4	0	13	2	13,000
24	3	1	1	0	3	2	5,070
25	3	1	2	0	4	2	5,080
26	3	1	3	0	3	2	3,360
27	3	1	4	0	6	2	6,300
28	3	1	5	0	9	2	9,000
29	3	2	1	0	4	3	4,658
30	3	2	2	0	8	2	8,000
31	3	3	1	0	1	1	5,400
32	3	3	2	0	4	3	4,604
33	3	3	3	0	4	2	5,120
34	3	3	4	0	5	2	5,000
35	3	3	5	0	8	2	8,000
36	4	1	1	1	14	3	24,951
37	4	1	2	1	13	2	21,060
38	4	1	3	1	21	2	31,500
39	4	1	4	0	24	2	65,280
40	4	1	5	0	38	2	59,660
41	4	1	6	0	65	2	65,000
42	4	2	1	1	14	2	21,140
43	4	2	2	0	21	2	66,780
44	4	2	3	0	27	2	73,170
45	4	2	4	0	32	2	63,360
46	4	2	5	0	38	2	62,320
47	4	2	6	0	54	2	69,660
48	4	3	1	0	46	3	49,067
49	5	1	1	1	4	2	7,680
50	5	1	2	1	7	2	8,330
51	5	1	3	0	11	3	11,000

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TABLE B-1. NUMBERS OF SCHOOLS IN POPULATION, SAMPLE NUMBERS PER PACKAGE, AND EXPECTED STUDENT WEIGHTS, TAP SAMPLE DESIGN FINAL STRATA, AGE 9

FINAL STRATUM CODE	REGION CODE	PRIMARY STRATUM CODE	SUB-STRATUM CODE	OVER-SAMPLING	NO. SCH. IN STRATUM	SAMPLE NO. PER PACKAGE	EXPECTED STUDENT WEIGHT
501	1	1	1	0	136	6	22,667
502	2	1	1	0	61	4	15,250
503	3	1	1	0	69	4	17,250
504	4	1	1	0	115	4	28,750
505	5	1	1	0	92	4	23,000

TABLE B-2. NUMBERS OF SCHOOLS IN POPULATION, SAMPLE NUMBERS PER PACKAGE, AND EXPECTED STUDENT WEIGHTS, TAP SAMPLE DESIGN FINAL STRATA, AGE 13

FINAL STRATUM CODE	REGION CODE	PRIMARY STRATUM CODE	SUB-STRATUM CODE	OVER-SAMPLING	NO. SCH. IN STRATUM	SAMPLE NO. PER PACKAGE	EXPECTED STUDENT WEIGHT
1	1	1	1	0	1	1	29,560
2	1	1	2	0	1	1	27,680
3	1	1	3	0	1	1	20,160
4	1	1	4	0	1	1	15,640
5	1	1	5	0	1	1	15,120
6	1	1	6	0	3	2	15,450
7	1	2	1	0	1	1	28,560
8	1	2	2	0	1	1	19,760
9	1	2	3	0	1	1	15,520
10	1	2	4	0	5	3	16,578
11	1	3	1	0	6	3	21,387
12	1	3	2	0	15	2	33,600
13	1	4	1	0	9	2	21,240
14	2	1	1	0	1	1	13,720
15	2	1	2	0	1	1	13,680
16	2	1	3	0	3	2	16,140
17	2	1	4	0	3	2	14,340
18	2	1	5	0	5	2	14,100
19	2	2	1	0	1	1	13,320
20	2	2	2	0	1	1	11,600
21	2	2	3	0	4	2	19,000
22	2	2	4	0	7	2	12,530
23	2	3	1	0	4	2	17,160
24	2	3	2	0	5	2	13,850
25	2	3	3	0	16	2	16,480
26	3	1	1	0	1	1	11,960
27	3	1	2	0	1	1	11,560
28	3	1	3	0	1	1	10,360
29	3	1	4	0	4	3	4,978
30	3	1	5	0	6	2	7,500
31	3	2	1	0	1	1	9,920
32	3	2	2	0	9	3	6,640
33	3	3	1	0	1	1	7,600
34	3	3	2	0	1	1	7,160
35	3	3	3	0	1	1	6,080
36	3	3	4	0	1	1	5,960
37	3	3	5	0	4	2	6,640
38	3	3	6	0	7	2	8,190
39	4	1	1	1	1	1	23,440
40	4	1	2	1	1	1	19,920
41	4	1	3	1	4	2	28,120
42	4	1	4	1	5	2	27,950
43	4	1	5	0	13	3	89,671
44	4	1	6	0	16	2	76,640
45	4	2	1	1	6	2	39,120
46	4	2	2	0	10	2	90,000
47	4	2	3	0	13	2	85,540
48	4	2	4	0	16	2	89,440
49	4	2	5	0	25	2	58,250
50	4	3	1	0	26	2	71,500
51	5	1	1	1	1	1	12,400

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TABLE B-2, NUMBERS OF SCHOOLS IN POPULATION, SAMPLE NUMBERS PER PACKAGE, AND EXPECTED STUDENT WEIGHTS, TAP SAMPLE DESIGN FINAL STRATA, AGE 13

FINAL STRATUM CODE	REGION CODE	PRIMARY STRATUM CODE	SUB-STRATUM CODE	OVER-SAMPLING	NO. SCH. IN STRATUM	SAMPLE NO. PER PACKAGE	EXPECTED STUDENT WEIGHT
52	5	1	2	1	1	1	8,000
53	5	1	3	1	1	1	4,920
54	5	1	4	0	4	3	10,631
55	5	2	1	0	4	3	15,538
56	5	2	2	0	3	2	12,000
57	5	2	3	0	5	2	11,400
58	5	3	1	1	6	3	11,760
59	5	3	2	0	5	3	9,844
60	5	3	3	0	9	2	9,000
61	6	1	1	0	1	1	16,400
62	6	1	2	0	1	1	16,320
63	6	1	3	0	1	1	14,440
64	6	1	4	0	1	1	10,560
65	6	1	5	0	1	1	10,480
66	6	1	6	0	1	1	8,120
67	6	2	1	1	7	3	7,156
68	6	2	2	0	4	3	14,702
69	6	2	3	0	5	2	11,150
70	6	2	4	0	11	2	11,000
71	6	3	1	1	8	2	8,000
72	6	3	2	0	6	2	6,840
73	7	1	1	1	3	2	9,690
74	7	1	2	0	6	2	28,500
75	7	2	1	1	9	3	13,200
76	7	2	2	0	8	3	21,689
77	7	2	3	0	7	2	17,570
78	7	2	4	0	10	2	19,400
79	7	2	5	0	19	2	21,280
80	7	3	1	1	11	2	11,000
81	7	3	2	0	21	2	21,000
82	8	1	1	0	1	1	8,520
83	8	1	2	0	1	1	8,000
84	8	1	3	0	1	1	7,720
85	8	2	1	1	4	3	7,573
86	8	2	2	1	4	2	6,880
87	8	2	3	0	1	1	9,480
88	8	2	4	0	3	2	10,710
89	8	2	5	0	3	2	7,320
90	8	2	6	0	9	2	11,430
91	8	3	1	0	1	1	3,800
92	8	3	2	0	1	1	3,040
93	8	3	3	0	8	2	8,000
94	9	1	1	0	1	1	2,430
95	9	1	2	0	1	1	2,430
96	9	1	3	0	1	1	8,480
97	9	1	4	0	1	1	7,960
98	9	1	5	0	1	1	5,520
99	9	2	1	0	1	1	2,550
100	9	2	2	0	1	1	7,600
101	9	2	3	0	1	1	5,880
102	9	2	4	0	1	1	5,760

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TABLE B-2. NUMBERS OF SCHOOLS IN POPULATION, SAMPLE NUMBERS PER PACKAGE, AND EXPECTED STUDENT WEIGHTS, TAP SAMPLE DESIGN FINAL STRATA, AGE 13

FINAL STRATUM CODE	REGION CODE	PRIMARY STRATUM CODE	SUB-STRATUM CODE	OVER-SAMPLING	NO. SCH. IN STRATUM	SAMPLE NO. PER PACKAGE	EXPECTED STUDENT WEIGHT
103	9	2	5	0	1	1	4,760
104	9	2	6	0	5	3	4,489
105	9	2	7	0	4	2	4,080
106	9	2	8	0	8	2	8,000
107	10	1	1	1	1	1	8,040
108	10	1	2	1	1	1	28,400
109	10	1	3	1	3	2	11,850
110	10	1	4	0	5	2	58,000
111	10	1	5	0	7	2	64,750
112	10	1	6	0	12	2	27,600
113	10	2	1	0	11	3	55,440
114	10	2	2	0	9	2	49,410
115	10	2	3	0	11	2	56,980
116	10	2	4	0	19	2	71,440
117	10	3	1	0	45	3	54,100
118	11	1	1	0	3	2	28,170
119	11	1	2	0	5	2	33,300
120	11	1	3	0	9	2	22,410
121	11	2	1	0	7	3	26,227
122	11	2	2	0	6	2	29,880
123	11	2	3	0	7	2	29,120
124	11	2	4	0	12	2	26,760
125	11	3	1	0	10	3	28,311
126	11	3	2	0	30	2	30,000
127	12	1	1	0	3	2	15,510
128	12	1	2	0	1	1	9,080
129	12	1	3	0	1	1	9,080
130	12	1	4	0	4	2	16,400
131	12	1	5	0	4	2	13,240
132	12	1	6	0	5	2	10,550
133	12	2	1	0	1	1	14,160
134	12	2	2	0	9	3	15,560
135	12	2	3	0	20	2	20,000
136	12	3	1	0	4	2	10,800
137	12	3	2	0	11	2	13,310
138	13	1	1	0	1	1	20,440
139	13	1	2	0	1	1	19,880
140	13	1	3	0	1	1	17,120
141	13	1	4	0	1	1	15,600
142	13	1	5	0	1	1	15,600
143	13	1	6	0	3	2	19,830
144	13	1	7	0	4	2	22,680
145	13	2	1	0	11	3	29,773
146	13	3	1	0	13	2	22,360
147	13	4	1	0	17	3	18,209
148	13	5	1	0	8	3	15,004
149	14	1	1	0	1	1	11,240
150	14	1	2	0	1	1	11,160
151	14	1	3	0	1	1	10,800
152	14	1	4	0	1	1	9,160
153	14	1	5	0	1	1	9,080

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TABLE B-2. NUMBERS OF SCHOOLS IN POPULATION, SAMPLE NUMBERS PER PACKAGE, AND EXPECTED STUDENT WEIGHTS, TAP SAMPLE DESIGN FINAL STRATA, AGE 13

FINAL STRATUM CODE	REGION CODE	PRIMARY STRATUM CODE	SUB-STRATUM CODE	OVER-SAMPLING	NO. SCH. IN STRATUM	SAMPLE NO. PER PACKAGE	EXPECTED STUDENT WEIGHT
154	14	1	6	0	1	1	2,000
155	14	2	1	0	7	3	6,533
156	14	2	2	0	8	2	8,000
157	14	3	1	0	1	1	9,560
158	14	3	2	0	1	1	8,120
159	14	3	3	0	4	3	4,142
160	14	3	4	0	6	2	6,000
161	15	1	1	0	1	1	11,000
162	15	1	2	0	1	1	10,800
163	15	1	3	0	1	1	10,680
164	15	1	4	0	1	1	7,400
165	15	2	1	0	1	1	5,470
166	15	2	2	0	1	1	10,160
167	15	2	3	0	1	1	3,800
168	15	2	4	0	1	1	3,240
169	15	2	5	0	3	2	4,830
170	15	2	6	0	3	2	3,000
171	15	2	7	0	9	2	9,000
172	15	3	1	0	7	3	5,382
173	16	1	1	0	1	1	13,120
174	16	1	2	0	1	1	10,960
175	16	1	3	0	1	1	10,360
176	16	1	4	0	3	2	12,510
177	16	1	5	0	3	2	10,590
178	16	2	1	0	4	3	9,706
179	16	2	2	0	4	2	10,480
180	16	2	3	0	12	2	12,000
181	16	3	1	0	4	2	8,320
182	16	3	2	0	10	2	10,000
183	16	3	3	0	10	2	10,000
184	17	1	1	0	1	1	13,880
185	17	1	2	0	1	1	13,720
186	17	1	3	0	4	3	13,458
187	17	1	4	0	4	2	9,040
188	17	2	1	0	4	3	11,715
189	17	2	2	0	5	2	11,650
190	17	2	3	0	8	2	12,640
191	17	2	4	0	15	2	15,000
192	17	3	1	0	3	2	8,940
193	17	3	2	0	12	2	15,600
194	18	1	1	0	1	1	15,160
195	18	1	2	0	1	1	14,920
196	18	1	3	0	1	1	13,480
197	18	2	1	0	1	1	14,240
198	18	2	2	0	1	1	10,320
199	18	2	3	0	1	1	10,280
200	18	2	4	0	1	1	9,800
201	18	2	5	0	1	1	9,720
202	18	2	6	0	1	1	8,880
203	18	2	7	0	1	1	7,040
204	18	2	8	0	6	2	8,160

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TABLE B-2. NUMBERS OF SCHOOLS IN POPULATION, SAMPLE NUMBERS PER PACKAGE, AND EXPECTED STUDENT WEIGHTS, TAP SAMPLE DESIGN FINAL STRATA, AGE 13

FINAL STRATUM CODE	REGION CODE	PRIMARY STRATUM CODE	SUB-STRATUM CODE	OVER-SAMPLING	NO. SCH. IN STRATUM	SAMPLE NO. PER PACKAGE	EXPECTED STUDENT WEIGHT
205	18	3	1	0	1	1	9,320
206	18	3	2	0	1	1	9,160
207	18	3	3	0	1	1	8,360
208	18	3	4	0	3	2	9,780
209	18	3	5	0	11	2	11,440
210	19	1	1	0	1	1	19,400
211	19	1	2	0	1	1	14,400
212	19	1	3	0	1	1	12,680
213	19	1	4	0	3	2	15,120
214	19	1	5	0	4	2	13,600
215	19	1	6	0	5	2	12,400
216	19	1	7	0	10	2	16,400
217	19	2	1	0	1	1	19,160
218	19	2	2	0	1	1	16,920
219	19	2	3	0	1	1	13,160
220	19	2	4	0	3	2	15,450
221	19	2	5	0	10	2	18,600
222	19	3	1	0	5	2	12,600
223	20	1	1	0	9	3	32,040
224	20	1	2	0	9	2	38,610
225	20	2	1	0	7	3	33,476
226	20	2	2	0	13	2	50,310
227	20	3	1	0	8	3	34,027
228	20	3	2	0	7	2	39,620
229	20	4	1	0	9	3	22,640
230	20	4	2	0	23	2	40,250

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TABLE B-2. NUMBERS OF SCHOOLS IN POPULATION, SAMPLE NUMBERS PER PACKAGE, AND EXPECTED STUDENT WEIGHTS, TAP SAMPLE DESIGN FINAL STRATA, AGE 13

FINAL STRATUM CODE	REGION CODE	PRIMARY STRATUM CODE	SUB-STRATUM CODE	OVER-SAMPLING	NO. SCH. IN STRATUM	SAMPLE NO. PER PACKAGE	EXPECTED STUDENT WEIGHT
501	1	1	1	0	106	6	17,667
502	2	1	1	0	61	3	20,333
503	3	1	1	0	53	3	17,667
504	4	1	1	0	101	5	20,200
505	5	1	1	0	72	4	18,000

TABLE B-3, NUMBERS OF SCHOOLS IN POPULATION, SAMPLE NUMBERS PER PACKAGE, AND EXPECTED STUDENT WEIGHTS, TAP SAMPLE DESIGN FINAL STRATA, AGE 17

FINAL STRATUM CODE	REGION CODE	PRIMARY STRATUM CODE	SUB-STRATUM CODE	OVER-SAMPLING	NO. SCH. IN STRATUM	SAMPLE NO. PER PACKAGE	EXPECTED STUDENT WEIGHT
205	17	2	2	0	6	3	9,973
206	17	2	3	0	8	2	9,200
207	17	2	4	0	14	2	7,560
208	17	3	1	0	4	2	9,520
209	17	3	2	0	13	2	6,890
210	18	1	1	0	1	1	6,150
211	18	1	2	0	1	1	4,820
212	18	2	1	0	1	1	6,290
213	18	2	2	0	1	1	5,520
214	18	2	3	0	1	1	8,000
215	18	2	4	0	1	1	7,320
216	18	2	5	0	4	2	2,960
217	18	3	1	0	1	1	14,680
218	18	3	2	0	1	1	6,640
219	18	3	3	0	1	1	6,240
220	18	3	4	0	1	1	6,080
221	18	3	5	0	13	3	6,529
222	19	1	1	0	1	1	5,400
223	19	1	2	0	1	1	5,290
224	19	1	3	0	1	1	20,600
225	19	1	4	0	1	1	20,000
226	19	1	5	0	1	1	19,560
227	19	1	6	0	1	1	18,360
228	19	1	7	0	1	1	12,720
229	19	1	8	0	1	1	10,840
230	19	2	1	0	1	1	6,550
231	19	2	2	0	1	1	22,440
232	19	2	3	0	1	1	22,120
233	19	2	4	0	1	1	16,800
234	19	2	5	0	1	1	7,600
235	19	2	6	0	3	2	3,690
236	19	3	1	0	5	2	5,850
237	20	1	1	0	4	3	24,587
238	20	1	2	0	5	2	19,800
239	20	2	1	0	4	2	30,480
240	20	2	2	0	11	2	25,960
241	20	3	1	0	1	1	28,160
242	20	3	2	0	1	1	26,120
243	20	3	3	0	1	1	24,080
244	20	3	4	0	1	1	22,880
245	20	3	5	0	6	3	23,147
246	20	4	1	0	5	2	26,200
247	20	4	2	0	21	2	13,230

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TABLE B-3. NUMBERS OF SCHOOLS IN POPULATION, SAMPLE NUMBERS PER PACKAGE, AND EXPECTED STUDENT WEIGHTS, TAP SAMPLE DESIGN FINAL STRATA, AGE 17

FINAL STRATUM CODE	REGION CODE	PRIMARY STRATUM CODE	SUB-STRATUM CODE	OVER-SAMPLING	NO. SCH. IN STRATUM	SAMPLE NO. PER PACKAGE	EXPECTED STUDENT WEIGHT
154	13	1	2	0	1	1	19,200
155	13	1	3	0	1	1	16,840
156	13	1	4	0	1	1	16,120
157	13	1	5	0	1	1	14,120
158	13	1	6	0	1	1	13,840
159	13	1	7	0	3	2	14,670
160	13	2	1	0	3	2	16,020
161	13	2	2	0	5	2	13,700
162	13	3	1	0	13	2	17,029
163	13	4	1	0	1	1	13,520
164	13	4	2	0	15	2	16,500
165	13	5	1	0	10	3	7,600
166	14	1	1	0	1	1	5,420
167	14	1	2	0	1	1	5,190
168	14	2	1	0	4	3	4,196
169	14	2	2	0	5	2	4,700
170	14	2	3	0	7	2	3,500
171	14	3	1	0	1	1	7,320
172	14	3	2	0	1	1	7,040
173	14	3	3	0	1	1	3,840
174	14	3	4	0	1	1	2,160
175	14	3	5	0	4	2	3,120
176	14	3	6	0	6	2	3,600
177	15	1	1	0	1	1	6,230
178	15	1	2	0	1	1	1,810
179	15	2	1	0	1	1	3,900
180	15	2	2	0	1	1	1,920
181	15	2	3	0	1	1	3,480
182	15	2	4	0	1	1	2,800
183	15	2	5	0	1	1	2,680
184	15	2	6	0	3	2	3,240
185	15	2	7	0	3	2	2,700
186	15	2	8	0	5	2	3,250
187	15	3	1	0	8	2	4,000
188	16	1	1	0	1	1	5,680
189	16	1	2	0	1	1	4,520
190	16	1	3	0	1	1	13,160
191	16	1	4	0	1	1	11,520
192	16	1	5	0	3	2	7,770
193	16	2	1	0	1	1	12,120
194	16	2	2	0	1	1	10,720
195	16	2	3	0	3	2	5,670
196	16	2	4	0	14	2	8,400
197	16	3	1	0	1	1	7,720
198	16	3	2	0	9	3	5,480
199	16	3	3	0	13	2	6,760
200	17	1	1	0	1	1	5,770
201	17	1	2	0	1	1	5,490
202	17	1	3	0	1	1	3,230
203	17	1	4	0	2	2	6,820
204	17	2	1	0	1	1	13,200

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TABLE B-3. NUMBERS OF SCHOOLS IN POPULATION, SAMPLE NUMBERS PER PACKAGE, AND EXPECTED STUDENT WEIGHTS, TAP SAMPLE DESIGN FINAL STRATA, AGE 17

FINAL STRATUM CODE	REGION CODE	PRIMARY STRATUM CODE	SUB-STRATUM CODE	OVER-SAMPLING	NO. SCH. IN STRATUM	SAMPLE NO. PER PACKAGE	EXPECTED STUDENT WEIGHT
103	8	2	10	0	5	2	3,700
104	8	3	1	0	7	2	4,130
105	9	1	1	0	1	1	4,030
106	9	1	2	0	1	1	3,760
107	9	1	3	0	1	1	2,310
108	9	1	4	0	1	1	4,640
109	9	2	1	0	1	1	2,510
110	9	2	2	0	1	1	8,480
111	9	2	3	0	1	1	6,160
112	9	2	4	0	1	1	4,760
113	9	2	5	0	1	1	4,560
114	9	2	6	0	3	2	3,780
115	9	2	7	0	4	2	4,120
116	9	2	8	0	7	2	3,850
117	10	1	1	1	1	1	6,510
118	10	1	2	1	1	1	13,960
119	10	1	3	1	1	1	9,320
120	10	1	4	1	1	1	4,080
121	10	1	5	0	5	3	34,511
122	10	1	6	0	5	2	44,750
123	10	1	7	0	13	2	41,859
124	10	2	1	0	3	2	46,890
125	10	2	2	0	3	2	35,970
126	10	2	3	0	4	2	38,720
127	10	2	4	0	5	2	41,500
128	10	2	5	0	12	2	6,120
129	10	3	1	0	41	2	51,660
130	11	1	1	0	3	2	31,080
131	11	1	2	0	3	2	23,940
132	11	1	3	0	9	2	19,080
133	11	2	1	0	1	1	27,480
134	11	2	2	0	1	1	21,400
135	11	2	3	0	1	1	21,200
136	11	2	4	0	3	2	28,740
137	11	2	5	0	7	2	43,120
138	11	2	6	0	8	2	19,840
139	11	3	1	0	7	3	27,004
140	11	3	2	0	27	2	22,951
141	12	1	1	0	1	1	7,920
142	12	1	2	0	1	1	4,630
143	12	1	3	0	1	1	10,760
144	12	1	4	0	1	1	10,560
145	12	1	5	0	1	1	8,320
146	12	1	6	0	1	1	8,080
147	12	1	7	0	4	2	11,360
148	12	2	1	0	1	1	12,280
149	12	2	2	0	4	2	11,920
150	12	2	3	0	23	2	15,640
151	12	3	1	0	1	1	10,040
152	12	3	2	0	14	3	4,854
153	13	1	1	0	1	1	20,920

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TABLE B-3. NUMBERS OF SCHOOLS IN POPULATION, SAMPLE NUMBERS PER PACKAGE, AND EXPECTED STUDENT WEIGHTS, TAP SAMPLE DESIGN FINAL STRATA, AGE 17

FINAL STRATUM CODE	REGION CODE	PRIMARY STRATUM CODE	SUB-STRATUM CODE	OVER-SAMPLING	NO. SCH. IN STRATUM	SAMPLE NO. PER PACKAGE	EXPECTED STUDENT WEIGHT
52	4	3	1	0	23	2	18,620
53	5	1	1	1	1	1	13,040
54	5	1	2	0	1	1	5,160
55	5	1	3	0	1	1	14,360
56	5	1	4	0	1	1	12,680
57	5	1	5	0	1	1	1,720
58	5	1	6	0	1	1	4,520
59	5	2	1	0	1	1	18,520
60	5	2	2	0	1	1	16,720
61	5	2	3	0	1	1	15,840
62	5	2	4	0	1	1	13,160
63	5	2	5	0	1	1	9,720
64	5	2	6	0	1	1	8,040
65	5	2	7	0	1	1	6,840
66	5	2	8	0	1	1	2,960
67	5	3	1	1	4	2	9,080
68	5	3	2	1	4	2	15,480
69	5	3	3	0	11	2	10,120
70	6	1	1	0	1	1	8,360
71	6	1	2	0	1	1	5,240
72	6	1	3	0	1	1	7,040
73	6	2	1	1	5	2	5,550
74	6	2	2	1	1	1	10,760
75	6	2	3	0	1	1	8,280
76	6	2	4	0	4	2	13,200
77	6	2	5	0	5	2	8,950
78	6	2	6	0	11	2	13,530
79	6	3	1	1	5	2	2,750
80	6	3	2	0	6	2	3,180
81	7	1	1	1	1	1	2,000
82	7	1	2	0	1	1	21,920
83	7	1	3	0	1	1	21,920
84	7	1	4	0	1	1	18,040
85	7	2	1	1	7	3	15,556
86	7	2	2	0	5	3	18,956
87	7	2	3	0	5	2	15,750
88	7	2	4	0	10	2	21,500
89	7	2	5	0	18	2	20,340
90	7	3	1	1	10	2	7,900
91	7	3	2	0	20	2	16,400
92	8	1	1	0	1	1	4,360
93	8	1	2	0	1	1	6,600
94	8	2	1	1	1	1	6,200
95	8	2	2	1	1	1	5,680
96	8	2	3	1	1	1	4,600
97	8	2	4	1	5	3	5,155
98	8	2	5	1	1	1	10,160
99	8	2	6	0	1	1	8,520
100	8	2	7	0	1	1	7,400
101	8	2	8	0	1	1	4,640
102	8	2	9	0	4	2	6,440

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TABLE B-3, NUMBERS OF SCHOOLS IN POPULATION, SAMPLE NUMBERS PER PACKAGE, AND EXPECTED STUDENT WEIGHTS, TAP SAMPLE DESIGN FINAL STRATA, AGE 17

FINAL STRATUM CODE	REGION CODE	PRIMARY STRATUM CODE	SUB-STRATUM CODE	OVER-SAMPLING	NO. SCH. IN STRATUM	SAMPLE NO. PER PACKAGE	EXPECTED STUDENT WEIGHT
1	1	1	1	0	1	1	19,520
2	1	1	2	0	1	1	16,840
3	1	1	3	0	1	1	16,400
4	1	1	4	0	1	1	15,920
5	1	1	5	0	1	1	9,960
6	1	1	6	0	1	1	7,760
7	1	2	1	0	1	1	7,140
8	1	2	2	0	1	1	25,160
9	1	2	3	0	1	1	17,160
10	1	3	1	0	1	1	12,960
11	1	3	2	0	1	1	12,240
12	1	3	3	0	4	2	13,120
13	1	3	4	0	7	2	14,210
14	1	4	1	0	3	2	6,420
15	1	4	2	0	5	2	8,650
16	2	1	1	0	1	1	7,200
17	2	1	2	0	1	1	21,200
18	2	1	3	0	1	1	21,160
19	2	1	4	0	1	1	16,000
20	2	1	5	0	1	1	14,040
21	2	1	6	0	1	1	6,240
22	2	1	7	0	1	1	2,920
23	2	2	1	0	1	1	15,280
24	2	2	2	0	1	1	10,720
25	2	2	3	0	3	2	9,870
26	2	2	4	0	6	2	5,160
27	2	3	1	0	1	1	14,080
28	2	3	2	0	6	3	9,733
29	2	3	3	0	12	2	16,920
30	3	1	1	0	1	1	4,860
31	3	1	2	0	1	1	3,010
32	3	1	3	0	5	2	10,050
33	3	1	4	0	4	2	3,520
34	3	2	1	0	1	1	10,080
35	3	2	2	0	9	3	7,280
36	3	3	1	0	1	1	12,000
37	3	3	2	0	1	1	9,160
38	3	3	3	0	1	1	6,560
39	3	3	4	0	3	3	3,613
40	3	3	5	0	7	2	6,650
41	4	1	1	1	1	1	23,560
42	4	1	2	1	3	2	24,090
43	4	1	3	1	4	2	23,200
44	4	1	4	0	4	2	54,600
45	4	1	5	0	5	2	55,650
46	4	1	6	0	14	2	60,059
47	4	2	1	1	4	2	33,880
48	4	2	2	0	7	2	75,951
49	4	2	3	0	7	2	67,481
50	4	2	4	0	9	2	82,081
51	4	2	5	0	18	2	40,501

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TABLE B-3, NUMBERS OF SCHOOLS IN POPULATION, SAMPLE NUMBERS PER PACKAGE, AND EXPECTED STUDENT WEIGHTS, TAP SAMPLE DESIGN FINAL STRATA, AGE 17

FINAL STRATUM CODE	REGION CODE	PRIMARY STRATUM CODE	SUB-STRATUM CODE	OVER-SAMPLING	NO. SCH. IN STRATUM	SAMPLE NO. PER PACKAGE	EXPECTED STUDENT WEIGHT
501	1	1	1	0	43	2	21,500
502	1	1	2	0	22	2	11,000
503	1	1	3	0	16	2	8,000
504	2	1	1	0	38	3	12,667
505	3	1	1	0	31	2	15,500
506	4	1	1	0	44	2	22,000
507	4	1	2	0	23	2	11,500
509	4	1	3	0	16	2	8.000
508	5	1	1	0	48	3	16,000

TABLE B-4. NUMBERS OF SCHOOLS IN POPULATION, SAMPLE NUMBERS PER PACKAGE, AND EXPECTED STUDENT WEIGHTS, TAP SAMPLE DESIGN FINAL STRATA, GRADE 6

FINAL STRATUM CODE	REGION CODE	PRIMARY STRATUM CODE	SUB-STRATUM CODE	OVER-SAMPLING	NO. SCH. IN STRATUM	SAMPLE NO. PER PACKAGE	EXPECTED STUDENT WEIGHT
1	1	1	1	0	4	2	18,380
2	1	1	2	0	6	2	18,300
3	1	1	3	0	10	2	19,600
4	1	1	4	0	17	2	18,360
5	1	2	1	0	3	2	19,440
6	1	2	2	0	9	2	20,925
7	1	2	3	0	17	2	22,779
8	1	3	1	0	1	1	22,280
9	1	3	2	0	5	3	16,811
10	1	3	3	0	7	2	17,080
11	1	3	4	0	20	2	18,200
12	1	4	1	0	12	3	14,633
13	2	1	1	0	4	2	10,620
14	2	1	2	0	7	2	12,950
15	2	1	3	0	8	2	13,240
16	2	1	4	0	9	2	12,915
17	2	1	5	0	11	2	12,815
18	2	2	1	0	4	3	12,231
19	2	2	2	0	5	2	14,450
20	2	2	3	0	9	2	15,660
21	2	3	1	0	1	1	11,320
22	2	3	2	0	1	1	11,240
23	2	3	3	0	3	2	13,575
24	2	3	4	0	5	2	14,800
25	2	3	5	0	15	2	16,125
26	3	1	1	0	1	1	3,690
27	3	1	2	0	1	1	14,320
28	3	1	3	0	1	1	11,840
29	3	1	4	0	1	1	6,520
30	3	1	5	0	1	1	5,960
31	3	1	6	0	1	1	4,080
32	3	1	7	0	1	1	3,880
33	3	1	8	0	6	2	6,676
34	3	2	1	0	1	1	10,960
35	3	2	2	0	1	1	5,880
36	3	2	3	0	8	3	5,472
37	3	3	1	0	1	1	8,560
38	3	3	2	0	1	1	8,480
39	3	3	3	0	1	1	6,760
40	3	3	4	0	1	1	5,600
41	3	3	5	0	1	1	4,840
42	3	3	6	0	1	1	4,120
43	3	3	7	0	4	2	7,320
44	3	3	8	0	8	2	7,320
45	4	1	1	1	14	3	30,893
46	4	1	2	1	13	2	33,214
47	4	1	3	1	20	2	28,461
48	4	1	4	0	21	2	70,769
49	4	1	5	0	36	2	74,247
50	4	1	6	0	67	2	79,898
51	4	2	1	1	6	2	43,830

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TABLE B-4, NUMBERS OF SCHOOLS IN POPULATION, SAMPLE NUMBERS PER PACKAGE, AND EXPECTED STUDENT WEIGHTS, TAP SAMPLE DESIGN FINAL STRATA, GRADE 6

FINAL STRATUM CODE	REGION CODE	PRIMARY STRATUM CODE	SUB-STRATUM CODE	OVER-SAMPLING	NO. SCH. IN STRATUM	SAMPLE NO. PER PACKAGE	EXPECTED STUDENT WEIGHT
52	4	2	2	0	8	2	81,920
53	4	2	3	0	10	2	83,100
54	4	2	4	0	12	2	81,359
55	4	2	5	0	14	2	84,349
56	4	2	6	0	32	2	74,080
57	4	3	1	0	32	3	51,911
58	5	1	1	1	1	1	9,520
59	5	1	2	1	6	3	9,000
60	5	1	3	0	1	1	12,000
61	5	1	4	0	1	1	11,400
62	5	1	5	0	7	2	8,645
63	5	2	1	0	1	1	20,760
64	5	2	2	0	1	1	10,440
65	5	2	3	0	1	1	10,080
66	5	2	4	0	3	2	14,295
67	5	2	5	0	3	2	11,865
68	5	2	6	0	3	2	5,535
69	5	3	1	1	1	1	10,760
70	5	3	2	1	3	2	8,685
71	5	3	3	1	6	2	9,567
72	5	3	4	0	3	2	14,640
73	5	3	5	0	12	2	15,651
74	6	1	1	0	1	1	7,640
75	6	1	2	0	1	1	18,920
76	6	1	3	0	1	1	15,360
77	6	1	4	0	1	1	12,040
78	6	1	5	0	1	1	9,840
79	6	2	1	1	3	2	9,615
80	6	2	2	1	4	2	6,975
81	6	2	3	0	1	1	13,520
82	6	2	4	0	1	1	12,560
83	6	2	5	0	1	1	11,720
84	6	2	6	0	3	2	9,990
85	6	2	7	0	5	2	12,725
86	6	2	8	0	10	2	10,493
87	6	3	1	1	10	2	8,256
88	6	3	2	0	6	2	6,510
89	7	1	1	1	8	3	11,715
90	7	1	2	0	11	2	22,000
91	7	2	1	1	1	1	15,[illegible]80
92	7	2	2	1	10	3	13,796
93	7	2	3	0	5	3	18,311
94	7	2	4	0	5	2	17,525
95	7	2	5	0	9	2	20,700
96	7	2	6	0	11	2	17,380
97	7	2	7	0	19	2	20,597
98	7	3	1	1	11	3	7,211
99	7	3	2	0	29	2	27,839
100	8	1	1	0	1	1	10,480
101	8	1	2	0	6	3	6,387
102	8	2	1	1	1	1	7,920

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TABLE B-4, NUMBERS OF SCHOOLS IN POPULATION, SAMPLE NUMBERS PER PACKAGE, AND EXPECTED STUDENT WEIGHTS, TAP SAMPLE DESIGN FINAL STRATA, GRADE 6

FINAL STRATUM CODE	REGION CODE	PRIMARY STRATUM CODE	SUB-STRATUM CODE	OVER-SAMPLING	NO. SCH. IN STRATUM	SAMPLE NO. PER PACKAGE	EXPECTED STUDENT WEIGHT
103	8	2	2	1	1	1	7,000
104	8	2	3	1	1	1	5,920
105	8	2	4	1	1	1	5,560
106	8	2	5	1	1	1	5,120
107	8	2	6	1	3	2	4,785
108	8	2	7	0	1	1	9,640
109	8	2	8	0	1	1	9,480
110	8	2	9	0	1	1	8,240
111	8	2	10	0	3	2	8,175
112	8	2	11	0	4	2	5,420
113	8	2	12	0	8	2	8,280
114	8	3	1	0	1	1	7,000
115	8	3	2	0	3	2	3,510
116	8	3	3	0	7	2	5,133
117	9	1	1	0	3	2	5,310
118	9	1	2	0	4	2	5,640
119	9	1	3	0	5	2	5,150
120	9	1	4	0	7	2	6,825
121	9	2	1	0	1	1	9,160
122	9	2	2	0	1	1	8,120
123	9	2	3	0	1	1	7,640
124	9	2	4	0	1	1	6,720
125	9	2	5	0	1	1	5,640
126	9	2	6	0	1	1	3,960
127	9	2	7	0	1	1	3,200
128	9	2	8	0	1	1	3,160
129	9	2	9	0	1	1	2,920
130	9	2	10	0	3	2	3,765
131	9	2	11	0	3	2	3,240
132	9	2	12	0	5	2	4,600
133	9	2	13	0	8	2	6,000
134	10	1	1	1	4	2	17,800
135	10	1	2	1	4	2	14,300
136	10	1	3	1	7	2	19,460
137	10	1	4	0	17	3	55,004
138	10	1	5	0	21	2	56,804
139	10	1	6	0	42	2	51,239
140	10	2	1	0	11	3	53,802
141	10	2	2	0	8	2	45,000
142	10	2	3	0	18	2	61,290
143	10	2	4	0	24	2	53,641
144	10	2	5	0	40	2	65,600
145	10	3	1	0	12	2	35,699
146	10	3	2	0	43	2	59,703
147	11	1	1	0	1	1	34,320
148	11	1	2	0	1	1	31,440
149	11	1	3	0	1	1	23,480
150	11	1	4	0	1	1	17,520
151	11	1	5	0	4	2	30,440
152	11	1	6	0	7	2	24,500
153	11	2	1	0	5	2	26,725

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TABLE B-4, NUMBERS OF SCHOOLS IN POPULATION, SAMPLE NUMBERS PER PACKAGE, AND EXPECTED STUDENT WEIGHTS, TAP SAMPLE DESIGN FINAL STRATA, GRADE 6

FINAL STRATUM CODE	REGION CODE	PRIMARY STRATUM CODE	SUB-STRATUM CODE	OVER-SAMPLING	NO. SCH. IN STRATUM	SAMPLE NO. PER PACKAGE	EXPECTED STUDENT WEIGHT
154	11	2	2	0	12	2	31,559
155	11	2	3	0	14	2	29,259
156	11	2	4	0	18	2	30,960
157	11	2	5	0	25	2	30,875
158	11	3	1	0	7	3	22,976
159	11	3	2	0	11	2	21,945
160	11	3	3	0	32	2	29,493
161	12	1	1	0	1	1	18,520
162	12	1	2	0	1	1	11,240
163	12	1	3	0	1	1	10,320
164	12	1	4	0	1	1	9,640
165	12	1	5	0	3	2	11,985
166	12	1	6	0	3	2	10,245
167	12	1	7	0	5	2	12,400
168	12	1	8	0	10	2	10,734
169	12	2	1	0	1	1	16,760
170	12	2	2	0	1	1	13,320
171	12	2	3	0	3	2	8,070
172	12	2	4	0	9	2	11,565
173	12	2	5	0	15	2	12,126
174	12	3	1	0	1	1	13,880
175	12	3	2	0	3	2	8,835
176	12	3	3	0	13	2	14,347
177	13	1	1	0	1	1	37,960
178	13	1	2	0	1	1	34,720
179	13	1	3	0	1	1	29,280
180	13	1	4	0	1	1	24,400
181	13	1	5	0	1	1	22,200
182	13	1	6	0	1	1	16,920
183	13	1	7	0	1	1	12,120
184	13	1	8	0	1	1	7,960
185	13	2	1	0	5	3	15,711
186	13	2	2	0	8	2	11,560
187	13	3	1	0	15	3	20,254
188	13	4	1	0	4	2	14,800
189	13	4	2	0	13	2	15,139
190	13	5	1	0	1	1	14,800
191	13	5	2	0	8	3	15,219
192	14	1	1	0	1	1	4,640
193	14	1	2	0	1	1	4,360
194	14	1	3	0	3	2	5,835
195	14	1	4	0	4	2	6,880
196	14	1	5	0	4	2	6,080
197	14	1	6	0	7	2	6,818
198	14	2	1	0	3	2	5,295
199	14	2	2	0	5	2	6,725
200	14	2	3	0	11	2	9,032
201	14	3	1	0	1	1	9,840
202	14	3	2	0	1	1	5,080
203	14	3	3	0	4	3	3,885
204	14	3	4	0	5	2	4,896

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TABLE B-4. NUMBERS OF SCHOOLS IN POPULATION, SAMPLE NUMBERS PER PACKAGE, AND EXPECTED STUDENT WEIGHTS, TAP SAMPLE DESIGN FINAL STRATA, GRADE 6

FINAL STRATUM CODE	REGION CODE	PRIMARY STRATUM CODE	SUB-STRATUM CODE	OVER-SAMPLING	NO. SCH. IN STRATUM	SAMPLE NO. PER PACKAGE	EXPECTED STUDENT WEIGHT
205	14	3	5	0	8	2	6,424
206	15	1	1	0	1	1	7,600
207	15	1	2	0	3	2	4,620
208	15	1	3	0	5	2	6,425
209	15	1	4	0	7	2	7,840
210	15	2	1	0	1	1	7,600
211	15	2	2	0	1	1	6,960
212	15	2	3	0	1	1	6,360
213	15	2	4	0	1	1	6,240
214	15	2	5	0	1	1	5,960
215	15	2	6	0	1	1	5,200
216	15	2	7	0	1	1	4,160
217	15	2	8	0	1	1	4,080
218	15	2	9	0	3	2	5,025
219	15	2	10	0	5	2	5,850
220	15	2	11	0	8	2	7,663
221	15	3	1	0	1	1	3,640
222	15	3	2	0	7	3	3,996
223	16	1	1	0	6	3	9,600
224	16	1	2	0	6	2	10,110
225	16	1	3	0	7	2	9,695
226	16	1	4	0	12	2	10,188
227	16	2	1	0	5	3	8,511
228	16	2	2	0	5	2	8,325
229	16	2	3	0	7	2	8,750
230	16	2	4	0	12	2	9,477
231	16	3	1	0	6	3	7,613
232	16	3	2	0	7	2	7,385
233	16	3	3	0	14	2	11,830
234	17	1	1	0	6	3	10,787
235	17	1	2	0	7	2	13,160
236	17	1	3	0	9	2	12,240
237	17	1	4	0	15	2	14,208
238	17	2	1	0	1	1	21,920
239	17	2	2	0	1	1	10,160
240	17	2	3	0	1	1	7,960
241	17	2	4	0	4	2	11,980
242	17	2	5	0	6	2	11,910
243	17	2	6	0	8	2	11,840
244	17	2	7	0	13	2	11,324
245	17	3	1	0	1	1	10,520
246	17	3	2	0	3	2	7,125
247	17	3	3	0	15	2	13,569
248	18	1	1	0	4	2	8,180
249	18	1	2	0	6	2	9,300
250	18	1	3	0	9	2	9,930
251	18	2	1	0	3	2	8,250
252	18	2	2	0	4	2	8,880
253	18	2	3	0	5	2	8,725
254	18	2	4	0	7	2	9,520
255	18	2	5	0	10	2	10,072

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TABLE B-4, NUMBERS OF SCHOOLS IN POPULATION, SAMPLE NUMBERS PER PACKAGE, AND EXPECTED STUDENT WEIGHTS, TAP SAMPLE DESIGN FINAL STRATA, GRADE 6

FINAL STRATUM CODE	REGION CODE	PRIMARY STRATUM CODE	SUB-STRATUM CODE	OVER-SAMPLING	NO. SCH. IN STRATUM	SAMPLE NO. PER PACKAGE	EXPECTED STUDENT WEIGHT
256	18	3	1	0	1	1	9,640
257	18	3	2	0	1	1	8,120
258	18	3	3	0	1	1	6,120
259	18	3	4	0	6	2	9,690
260	18	3	5	0	8	2	8,640
261	18	3	6	0	17	2	12,750
262	19	1	1	0	3	2	13,170
263	19	1	2	0	4	2	12,800
264	19	1	3	0	5	2	14,050
265	19	1	4	0	6	2	14,280
266	19	1	5	0	8	2	16,320
267	19	1	6	0	8	2	13,560
268	19	1	7	0	12	2	14,460
269	19	2	1	0	5	3	13,389
270	19	2	2	0	5	2	15,850
271	19	2	3	0	6	2	13,590
272	19	2	4	0	12	2	16,040
273	19	3	1	0	7	2	11,382
274	20	1	1	0	5	2	34,700
275	20	1	2	0	5	2	32,375
276	20	1	3	0	10	2	44,222
277	20	2	1	0	9	3	31,200
278	20	2	2	0	13	3	21,060
279	20	2	3	0	20	2	37,900
280	20	3	1	0	3	2	28,470
281	20	3	2	0	5	2	39,400
282	20	3	3	0	11	2	28,490
283	20	4	1	0	7	2	30,905
284	20	4	2	0	11	2	24,750
285	20	4	3	0	27	2	29,243

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TABLE B-4. NUMBERS OF SCHOOLS IN POPULATION, SAMPLE NUMBERS PER PACKAGE, AND EXPECTED STUDENT WEIGHTS, TAP SAMPLE DESIGN FINAL STRATA, GRADE 6

FINAL STRATUM CODE	REGION CODE	PRIMARY STRATUM CODE	SUB-STRATUM CODE	OVER-SAMPLING	NO. SCH. IN STRATUM	SAMPLE NO. PER PACKAGE	EXPECTED STUDENT WEIGHT
501	1	1	1	0	18	2	9,000
502	1	1	2	0	23	2	11,500
503	1	1	3	0	42	2	21,000
504	2	1	1	0	48	3	16,000
505	3	1	1	0	49	3	16,333
506	4	1	1	0	34	3	11,333
507	4	1	2	0	50	2	25,000
508	5	1	1	0	17	2	8,500
509	5	1	2	0	43	2	21,500

TABLE B-5. NUMBERS OF SCHOOLS IN POPULATION, SAMPLE NUMBERS PER PACKAGE, AND EXPECTED STUDENT WEIGHTS, TAP SAMPLE DESIGN FINAL STRATA, GRADE 11

FINAL STRATUM CODE	REGION CODE	PRIMARY STRATUM CODE	SUB-STRATUM CODE	OVER-SAMPLING	NO. SCH. IN STRATUM	SAMPLE NO. PER PACKAGE	EXPECTED STUDENT WEIGHT
1	1	1	1	0	1	1	22,720
2	1	1	2	0	1	1	20,520
3	1	1	3	0	1	1	21,320
4	1	1	4	0	1	1	19,160
5	1	1	5	0	1	1	11,640
6	1	1	6	0	1	1	10,000
7	1	2	1	0	1	1	9,010
8	1	2	2	0	1	1	32,200
9	1	2	3	0	1	1	21,160
10	1	3	1	0	1	1	16,120
11	1	3	2	0	1	1	14,880
12	1	3	3	0	4	2	21,880
13	1	3	4	0	7	2	16,240
14	1	4	1	0	3	2	11,190
15	1	4	2	0	5	2	7,747
16	2	1	1	0	1	1	9,170
17	2	1	2	0	1	1	25,960
18	2	1	3	0	1	1	25,600
19	2	1	4	0	1	1	20,360
20	2	1	5	0	1	1	17,200
21	2	1	6	0	1	1	7,040
22	2	1	7	0	1	1	3,720
23	2	2	1	0	1	1	18,600
24	2	2	2	0	1	1	12,280
25	2	2	3	0	3	2	11,700
26	2	2	4	0	6	2	10,452
27	2	3	1	0	1	1	18,120
28	2	3	2	0	6	3	14,373
29	2	3	3	0	12	2	15,451
30	3	1	1	0	1	1	5,700
31	3	1	2	0	1	1	3,510
32	3	1	3	0	5	2	10,850
33	3	1	4	0	4	2	5,218
34	3	2	1	0	1	1	12,600
35	3	2	2	0	9	3	8,160
36	3	3	1	0	1	1	15,080
37	3	3	2	0	1	1	11,800
38	3	3	3	0	1	1	7,840
39	3	3	4	0	3	3	4,333
40	3	3	5	0	7	2	9,442
41	4	1	1	1	1	1	27,720
42	4	1	2	1	3	2	30,360
43	4	1	3	1	4	2	20,920
44	4	1	4	0	4	2	63,440
45	4	1	5	0	5	2	67,500
46	4	1	6	0	14	2	22,820
47	4	2	1	1	4	2	13,400
48	4	2	2	0	7	2	101,290
49	4	2	3	0	7	2	88,270
50	4	2	4	0	9	2	96,300
51	4	2	5	0	18	2	83,430

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TABLE B-5. NUMBERS OF SCHOOLS IN POPULATION, SAMPLE NUMBERS PER PACKAGE, AND EXPECTED STUDENT WEIGHTS, TAP SAMPLE DESIGN FINAL STRATA, GRADE 11

FINAL STRATUM CODE	REGION CODE	PRIMARY STRATUM CODE	SUB-STRATUM CODE	OVER-SAMPLING	NO. SCH. IN STRATUM	SAMPLE NO. PER PACKAGE	EXPECTED STUDENT WEIGHT
52	4	3	1	0	23	2	80,155
53	5	1	1	1	1	1	16,760
54	5	1	2	0	1	1	6,370
55	5	1	3	0	1	1	18,120
56	5	1	4	0	1	1	17,440
57	5	1	5	0	1	1	2,260
58	5	1	6	0	1	1	5,600
59	5	2	1	0	1	1	21,880
60	5	2	2	0	1	1	20,200
61	5	2	3	0	1	1	19,640
62	5	2	4	0	1	1	16,000
63	5	2	5	0	1	1	11,560
64	5	2	6	0	1	1	9,800
65	5	2	7	0	1	1	8,480
66	5	2	8	0	1	1	3,800
67	5	3	1	1	4	2	14,560
68	5	3	2	1	4	2	14,480
69	5	3	3	0	11	2	19,371
70	6	1	1	0	1	1	10,700
71	6	1	2	0	1	1	6,970
72	6	1	3	0	1	1	8,680
73	6	2	1	1	5	2	11,600
74	6	2	2	1	1	1	12,520
75	6	2	3	0	1	1	9,920
76	6	2	4	0	4	2	11,720
77	6	2	5	0	5	2	12,800
78	6	2	6	0	11	2	13,427
79	6	3	1	1	5	2	6,946
80	6	3	2	0	6	2	7,073
81	7	1	1	1	1	1	1,826
82	7	1	2	0	1	1	27,920
83	7	1	3	0	1	1	27,000
84	7	1	4	0	1	1	23,160
85	7	2	1	1	7	3	7,539
86	7	2	2	0	5	3	27,400
87	7	2	3	0	5	2	24,750
88	7	2	4	0	10	2	22,100
89	7	2	5	0	18	2	22,632
90	7	3	1	1	10	2	11,905
91	7	3	2	0	20	2	22,644
92	8	1	1	0	1	1	5,340
93	8	1	2	0	1	1	8,680
94	8	2	1	1	1	1	7,960
95	8	2	2	1	1	1	7,240
96	8	2	3	1	1	1	5,560
97	8	2	4	1	5	3	7,101
98	8	2	5	1	1	1	12,680
99	8	2	6	0	1	1	11,600
100	8	2	7	0	1	1	9,520
101	8	2	8	0	1	1	6,360
102	8	2	9	0	4	2	6,640

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TABLE B-5. NUMBERS OF SCHOOLS IN POPULATION, SAMPLE NUMBERS PER PACKAGE, AND EXPECTED STUDENT WEIGHTS, TAP SAMPLE DESIGN FINAL STRATA, GRADE 11

FINAL STRATUM CODE	REGION CODE	PRIMARY STRATUM CODE	SUB-STRATUM CODE	OVER-SAMPLING	NO. SCH. IN STRATUM	SAMPLE NO. PER PACKAGE	EXPECTED STUDENT WEIGHT
103	8	2	10	0	5	2	5,568
104	8	3	1	0	7	2	7,318
105	9	1	1	0	1	1	4,780
106	9	1	2	0	1	1	4,320
107	9	1	3	0	1	1	3,080
108	9	1	4	0	1	1	7,320
109	9	2	1	0	1	1	3,060
110	9	2	2	0	1	1	12,320
111	9	2	3	0	1	1	7,040
112	9	2	4	0	1	1	6,000
113	9	2	5	0	1	1	5,760
114	9	2	6	0	3	2	4,260
115	9	2	7	0	4	2	4,728
116	9	2	8	0	7	2	9,499
117	10	1	1	1	1	1	9,270
118	10	1	2	1	1	1	19,160
119	10	1	3	1	1	1	11,200
120	10	1	4	1	1	1	6,280
121	10	1	5	0	5	3	58,178
122	10	1	6	0	5	2	49,200
123	10	1	7	0	13	2	64,952
124	10	2	1	0	3	2	62,730
125	10	2	2	0	3	2	42,810
126	10	2	3	0	4	2	54,200
127	10	2	4	0	5	2	53,550
128	10	2	5	0	12	2	70,440
129	10	3	1	0	41	2	58,332
130	11	1	1	0	3	2	36,480
131	11	1	2	0	3	2	30,840
132	11	1	3	0	9	2	45,360
133	11	2	1	0	1	1	30,600
134	11	2	2	0	1	1	27,080
135	11	2	3	0	1	1	26,600
136	11	2	4	0	3	2	35,940
137	11	2	5	0	7	2	44,170
138	11	2	6	0	8	2	32,800
139	11	3	1	0	7	3	31,640
140	11	3	2	0	27	2	33,690
141	12	1	1	0	1	1	9,950
142	12	1	2	0	1	1	5,900
143	12	1	3	0	1	1	13,600
144	12	1	4	0	1	1	14,160
145	12	1	5	0	1	1	10,240
146	12	1	6	0	1	1	10,200
147	12	1	7	0	4	2	10,200
148	12	2	1	0	2	1	16,120
149	12	2	2	0	4	2	10,760
150	12	2	3	0	23	2	29,488
151	12	3	1	0	1	1	12,160
152	12	3	2	0	14	3	16,226
153	13	1	1	0	1	1	27,040

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TABLE B-5. NUMBERS OF SCHOOLS IN POPULATION, SAMPLE NUMBERS PER PACKAGE, AND EXPECTED STUDENT WEIGHTS, TAP SAMPLE DESIGN FINAL STRATA, GRADE 11

FINAL STRATUM CODE	REGION CODE	PRIMARY STRATUM CODE	SUB-STRATUM CODE	OVER-SAMPLING	NO. SCH. IN STRATUM	SAMPLE NO. PER PACKAGE	EXPECTED STUDENT WEIGHT
154	13	1	2	0	1	1	24,920
155	13	1	3	0	1	1	21,880
156	13	1	4	0	1	1	22,920
157	13	1	5	0	1	1	19,200
158	13	1	6	0	1	1	19,960
159	13	1	7	0	3	2	20,550
160	13	2	1	0	3	2	23,280
161	13	2	2	0	5	2	10,150
162	13	3	1	0	13	2	17,350
163	13	4	1	0	1	1	16,960
164	13	4	2	0	15	2	23,100
165	13	5	1	0	10	3	18,543
166	14	1	1	0	1	1	6,640
167	14	1	2	0	1	1	6,640
168	14	2	1	0	4	3	5,102
169	14	2	2	0	5	2	6,150
170	14	2	3	0	7	2	10,072
171	14	3	1	0	1	1	9,040
172	14	3	2	0	1	1	9,480
173	14	3	3	0	1	1	5,240
174	14	3	4	0	1	1	2,840
175	14	3	5	0	4	2	4,848
176	14	3	6	0	6	2	7,571
177	15	1	1	0	1	1	7,550
178	15	1	2	0	1	1	2,360
179	15	2	1	0	1	1	4,850
180	15	2	2	0	1	1	2,240
181	15	2	3	0	1	1	4,280
182	15	2	4	0	1	1	3,320
183	15	2	5	0	1	1	3,400
184	15	2	6	0	3	2	4,160
185	15	2	7	0	3	2	3,758
186	15	2	8	0	5	2	5,609
187	15	3	1	0	8	2	10,134
188	16	1	1	0	1	1	7,300
189	16	1	2	0	1	1	5,840
190	16	1	3	0	1	1	14,960
191	16	1	4	0	1	1	15,080
192	16	1	5	0	3	2	10,594
193	16	2	1	0	1	1	15,280
194	16	2	2	0	1	1	13,200
195	16	2	3	0	3	2	11,220
196	16	2	4	0	14	2	19,016
197	16	3	1	0	1	1	10,200
198	16	3	2	0	9	3	8,194
199	16	3	3	0	13	2	14,521
200	17	1	1	0	1	1	7,160
201	17	1	2	0	1	1	6,590
202	17	1	3	0	1	1	4,130
203	17	1	4	0	2	2	9,000
204	17	2	1	0	1	1	16,720

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TABLE B-5. NUMBERS OF SCHOOLS IN POPULATION, SAMPLE NUMBERS PER PACKAGE, AND EXPECTED STUDENT WEIGHTS, TAP SAMPLE DESIGN FINAL STRATA, GRADE 11

FINAL STRATUM CODE	REGION CODE	PRIMARY STRATUM CODE	SUB-STRATUM CODE	OVER-SAMPLING	NO. SCH. IN STRATUM	SAMPLE NO. PER PACKAGE	EXPECTED STUDENT WEIGHT
205	17	2	2	0	6	3	12,533
206	17	2	3	0	8	2	12,800
207	17	2	4	0	14	2	18,908
208	17	3	1	0	4	2	6,960
209	17	3	2	0	13	2	16,360
210	18	1	1	0	1	1	7,750
211	18	1	2	0	1	1	6,170
212	18	2	1	0	1	1	8,110
213	18	2	2	0	1	1	6,910
214	18	2	3	0	1	1	10,200
215	18	2	4	0	1	1	9,640
216	18	2	5	0	4	2	5,191
217	18	3	1	0	1	1	19,200
218	18	3	2	0	1	1	8,200
219	18	3	3	0	1	1	7,520
220	18	3	4	0	1	1	8,200
221	18	3	5	0	13	3	11,031
222	19	1	1	0	1	1	6,730
223	19	1	2	0	1	1	6,720
224	19	1	3	0	1	1	23,320
225	19	1	4	0	1	1	24,960
226	19	1	5	0	1	1	23,080
227	19	1	6	0	1	1	21,800
228	19	1	7	0	1	1	16,720
229	19	1	8	0	1	1	12,960
230	19	2	1	0	1	1	8,090
231	19	2	2	0	1	1	27,160
232	19	2	3	0	1	1	25,600
233	19	2	4	0	1	1	21,600
234	19	2	5	0	1	1	9,160
235	19	2	6	0	3	2	5,761
236	19	3	1	0	5	2	11,903
237	20	1	1	0	4	3	31,733
238	20	1	2	0	5	2	41,700
239	20	2	1	0	4	2	41,240
240	20	2	2	0	11	2	30,580
241	20	3	1	0	1	1	34,560
242	20	3	2	0	1	1	33,400
243	20	3	3	0	1	1	29,240
244	20	3	4	0	1	1	28,240
245	20	3	5	0	6	3	33,749
246	20	4	1	0	5	2	32,150
247	20	4	2	0	21	2	34,650

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TABLE B-5. NUMBERS OF SCHOOLS IN POPULATION, SAMPLE NUMBERS PER PACKAGE, AND EXPECTED STUDENT WEIGHTS, TAP SAMPLE DESIGN FINAL STRATA, GRADE 11

FINAL STRATUM CODE	REGION CODE	PRIMARY STRATUM CODE	SUB-STRATUM CODE	OVER-SAMPLING	NO. SCH. IN STRATUM	SAMPLE NO. PER PACKAGE	EXPECTED STUDENT WEIGHT
501	1	1	1	0	43	2	21,500
502	1	1	2	0	22	2	11,000
503	1	1	3	0	16	2	8,000
504	2	1	1	0	38	3	12,667
505	3	1	1	0	31	2	15,500
506	4	1	1	0	44	2	22,000
507	4	1	2	0	23	2	11,500
509	4	1	3	0	16	2	8,000
508	5	1	1	0	48	3	16,000

APPENDIX C

WEIGHTING PROCEDURE, P-VALUE EQUATION, AND SAMPLING ERROR MODEL FOR TEXAS ASSESSMENT PROJECT SAMPLE DESIGN

APPENDIX C

Weighting Procedure, P-Value Equation,
and Sampling Error Model

The parameters of the sample design and the models to compute the sample weights, weighted percent correct, and its sampling error are provided in this appendix.

For each item in each assessment instrument, symbols used in the formulas for the weight equation, weighted percent correct, and the sampling error model are as follows:

Y_{hij} = the response for the jth pupil in the ith sample school of the hth substratum or final stratum.
Its values are:

1 - if pupil (hij) gives an acceptable response

0 - otherwise.

X^{g}_{hij} = the reporting group or subpopulation variable.
Its values are:

1 - if pupil (hij) belongs to subpopulation or reporting group (g)

0 - otherwise.
(For the entire population, $X_{jii} = 1$ for every student record when no subpopulations are analyzed.)

L = the number of substrata.

M_h = the total number of schools in substratum (h).

m'_h = the number of schools selected from substratum (h).

m_h = the number of schools of substratum (h) that actually participated.

N_{hi} = the number of pupils enrolled in the assessed population in selected school (i), substratum (h).

n'_{hi} = the number of pupils selected for the sample of school (hi).

n_{hi} = the number of pupils of the sample that completed an assessment instrument in school (hi).

p_g = the estimated proportion of reporting group (g) giving acceptable answers to the item.

$V(p^g)$ = the estimate of the variance of the P-value of reporting group (g) for the item. The square root of $V(p^g)$ is the sampling error.

Using these symbols,

P_{hij} = the probability of selection of pupil (hij).

$$P_{hij} = \frac{m'_h}{M_h} \cdot \frac{n'_{hi}}{N_{hi}} .$$

f_{hij} = adjustment for nonresponse of pupil (hij).

f_{hij} = (adjustment for school nonresponse) x (adjustment for pupil nonresponse).

$$f_{hi} = \frac{m'_h}{m_h} \cdot \frac{n'_{hi}}{n_{hi}} .$$

W_{hij} = the weight to be applied to Y^g_{hij} and X^g_{hij}, all values of g.

$$W_{hij} = \frac{1}{P_{hi}} \cdot f_{hi} = \frac{M_h}{m'_h} \cdot \frac{N_{hi}}{n'_{hi}} \cdot \frac{m'_h}{m_h} \cdot \frac{n'_{hi}}{n_{hi}} = \frac{N_{hi}}{n_{hi}} \frac{M_h}{m_h} . \quad (1)$$

p^g = the estimate of the P-value for reporting group (g).

$$p^g = \frac{\sum_{h=1}^{L} \sum_{i=1}^{m_h} \sum_{j=1}^{n_h} X^g_{hij} W_{hij} Y_{hij}}{\sum_{h=1}^{L} \sum_{i=1}^{m_h} \sum_{j=1}^{n_h} X^g_{hij} W_{hij}} . \quad (2)$$

Let

Y^g = the numerator of p^g (= the weighted sum of the responses for group (g)),

X^g = the donominator of p^g (= the sum of the weights), and

$$Z^g_{hij} = \frac{[Y_{hij} - p^g] X^g_{hij} W_{hij}}{X^g} .$$

Then

$$z^g_{hi+} = \sum_{j=1}^{n_{hi}} z^g_{hij}$$

(= the sum of those values for school (i), final stratum (h)),

$$z^g_{h'+} = \frac{1}{m_h} \sum_{i=1}^{m_h} z^g_{hi+}$$

(= the mean for the sample schools of stratum (h)), and

$$z^g_{hi'} = \frac{1}{N_{hi}} z^g_{hi+}$$

(= the mean for the pupils of school (hi)).

The estimate of the variance of the population P-value can then be computed as

$$V(p^g) = \sum_{h=1}^{L} \left(\frac{M_h - m_h}{M_h}\right) m_h \sum_{i=1}^{m_h} \frac{(z^g_{hi+} - z^g_{h'+})^2}{(n_{hi} - 1)} \qquad (3)$$

$$+ \sum_{h=1}^{L} \frac{m_h}{M_h} \sum_{i=1}^{m_h} \left(\frac{N_{hi} - n_{hi}}{N_{hi}}\right) n_{hi} \sum_{j=1}^{n_{hi}} \frac{(z^g_{hij} - z^g_{hi'})^2}{(n_{hi} - 1)}$$

If nonresponse among students is low, the second part of the formula produces a variance component that is quite small relative to that of the first part, and using the first part only will give a good approximation of the sampling variance.

The sampling error of (p^g) equals the square of $V(p^g)$. The factors $\left(\frac{M_h - m_h}{M_h}\right)$ and $\left(\frac{N_{hi} - n_{hi}}{N_{hi}}\right)$ of $V(p^g)$ are the finite population correction factors for the first (school) and second (pupil) stages of sampling.